

**EFFECTIVENESS OF CAPACITY BUILDING ON  
MEDICATION MANAGEMENT**

**BY  
E.PAULINE**

**A DISSERTATION SUBMITTED TO THE TAMILNADU DR.M.G.R.MEDICAL  
UNIVERSITY, CHENNAI, IN PARTIAL FULFILMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF MASTER  
OF SCIENCE IN NURSING**

**MARCH 2011**

**EFFECTIVENESS OF CAPACITY BUILDING ON  
MEDICATION MANAGEMENT**

**Approved by the Dissertation Committee on :** \_\_\_\_\_

**Research Guide** : \_\_\_\_\_

**Dr. Latha Venkatesan**  
**M.Sc., (N), M.Phil., Ph.D.,**  
Principal and Professor in Nursing,  
Apollo college of Nursing,  
Chennai – 600 095.

**Clinical Guide** : \_\_\_\_\_

**Mrs.Nesa Sathya Satchi M.Sc., (N)**  
Reader, Pediatrics,  
Apollo College of Nursing,  
Chennai – 600 095.

**Medical Expert** : \_\_\_\_\_

**Dr.Mathrubootham Sridhar**  
**MRCP ch (UK)**  
Consultant Pediatrician  
Apollo Children's Hospitals,  
Chennai – 600 034.

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## **DECLARATION**

I hereby declare that the present dissertation titled’’ **EFFECTIVENESS OF CAPACITY BUILDING ON MEDICATION MANAGEMENT AMONG STUDENT NURSES’’** is the outcome of the original research work undertaken and carried out by me under the guidance of **Dr. Latha Venkatesan, M.Sc (N), M.Phil., Ph.D.**, Principal and professor in Maternity Nursing and **Mrs. Nesa Sathya Satchi, M.Sc (N)., Reader** Pediatrics, Apollo College of Nursing, Chennai. I also declare that the material of this has not formed in anyway, the basis for the award of any degree or diploma in this university or any other universities.

**M. Sc (N) II–Year**

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**“Trust in the lord with all thine heart; and lean not unto thine own understanding”**

**Proverb.3.5**

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## **SYNOPSIS**

A Pre experimental study to assess the effectiveness of capacity building on medication management among student nurses at Apollo college of Nursing –Chennai.

### **The objectives of the study were**

1. To assess the existing level of knowledge, attitude and practice regarding medication management among student nurses.
2. To compare the effectiveness of capacity building on medication management among student nurses.
3. To inter-correlate the knowledge, attitude and practice regarding medication management among student nurses before and after implementation of capacity building program.
4. To determine the association between selected demographic variables and knowledge, attitude and practice of student nurses before and after implementation of capacity building program.

An extensive review of literature and guidance by experts laid the foundation to the development of structured questionnaire, rating scale on level of attitude and checklist to assess the practice. The conceptual framework was based on J.W.Kenny'S Open system model.

A pre experimental research approach with a pre experimental type of one group pre and post test design was used to achieve the objectives of the study. The present

study was conducted among the student nurses of Apollo College of nursing Chennai, using non probability purposive sampling technique.

The instruments used for data collection were demographic variables proforma, structured questionnaire to assess the knowledge, rating scale to assess the level of attitude and checklist to assess the practice on capacity building on medication management. The data collection tools were validated and the reliability was determined by pilot study following which data was collected for main study. After pre test capacity building program was implemented among the student nurses.

The post test was conducted one week after the pre test .The collected data was tabulated and analyzed using descriptive and inferential statistics. Frequency and percentage were computed to summarize the sample characteristics. Mean and Standard deviation were used to compare the pre test and post test level of knowledge, attitude and practice on medication management.

Chi square test was applied to find out the association between the knowledge, attitude and practice of student nurses with selected demographic characteristics and 't' test distribution for analyzing the various aspects of medication management. Pearson correlation was used to determine the correlation between knowledge, attitude and practice on medication management among student nurses.

### **Major findings of the study**

- Majority of the student nurses (80%) belong to the age group of 19-20years.

Most of the student nurses (63.3 %) were Christians. All the student nurses who participated had previous knowledge on medication management.

- Majority of the student nurses (76.7%) had inadequate knowledge after the capacity building program on medication management and most of the student nurses (60%) have shown a significant improvement in the knowledge scores. The pretest attitude of the student nurses revealed that only (26.7%) had positive attitude on medication management but in the post test most of the students nurse (60%) had positive attitude regarding medication management. and most of them (36.7%) had inadequate practice but in the post test most of the student nurse (56.7%) had adequate practice and only 10% had inadequate practice.
- Comparison of pre test and post test knowledge, attitude and practice was done revealed significant improvement among the student nurses. The mean knowledge score of student nurses in the pre test was (M=10.87; SD=2.945) and in the post test (M= 17.80; SD=3.718) which is statistically significant with the 't' value of 9.297 ( $p < 0.05$ ). Hence the null hypothesis  $H_0$  was rejected.
- The mean attitude score of student nurses in the post test was M=38.33; SD=4.604 when compared to pre test value of M= 33.30; SD=6.849 with 't' value of 5.810 ( $p < 0.05$ ), which was statistically significant. Hence the null hypothesis  $H_0$  was rejected.
- The mean practice score of student nurses in the post test was M=17.30; SD=3.239) but showed statistically significant improvement when compared to pre test score of M=12.40; SD=2.848 with 't' value of 8.280 ( $P < 0.05$ ). Hence the null hypothesis  $H_0$  was rejected.
- The correlation between the knowledge, attitude and practice was assessed in the pre test and post test among student nurses. The study concluded that there is a positive correlation between the knowledge and attitude with the pretest and the



post test 'r' value of .011 and .050 respectively. There was a positive correlation between knowledge and practice of student nurses in the pre test and post test with the 'r' value of .245 and .346 respectively. Significant correlation occurred between the attitude and practice of student nurses with 'r' value of .289, and statistically significant correlation occurred between attitude and practice in the post test among student nurses with 'r' value of -.474 ( $p>0.01$ ). Hence the null hypothesis Ho2 was rejected.

- The present study shows that there was no significant association between selected demographic variables and the knowledge, attitude and practice of student nurses. Hence the null hypothesis Ho3 is accepted.

### **Recommendations**

- An experimental study can be conducted for a large group of student nurses
- An observational study can be conducted to assess the practice of student nurses on medication management and assess the statistics and type of medication errors that occurs commonly.
- An experimental study can be done by conducting a training program on medication management
- The same study can be conducted for the community health nurses and school health nursing personnel.

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## CHAPTER – I

### INTRODUCTION

#### BACKGROUND OF THE STUDY

**"Nursing encompasses an art, a humanistic orientation, a feeling for the value of the individual, and an intuitive sense of ethics, and of the appropriateness of action taken."**

**-- Myrtle Aydelotte**

A nurse is a healthcare professional who, in collaboration with other members of a health care team, is responsible for treatment, safety, and recovery of acutely or chronically ill individuals; health promotion and maintenance within families, communities and populations and treatment of life-threatening emergencies in a wide range of health care settings.

Nurses perform a wide range of clinical and non-clinical functions necessary to the delivery of health care, and may also be involved in medical and nursing research. Nurses have a significant role in the management of drug therapy. A holistic nursing approach to care is crucial for the success of drug therapy initiation, maintenance and evaluation. Each nurse is expected to develop and maintain competence with regard to all aspects of medication management, ensuring that his or her knowledge, skills and clinical practice are up to date.

In drug therapy today, nurses, together with physicians and pharmacists, participate in a system of checks and balances designed to promote beneficial effects



and prevent harm. Nurses are especially important within this system because it is the nurse not the physician who follows the patient's status more closely. As a result nurses are likely to be the first member of the health care team to observe and evaluate drug responses, and to intervene if required.

Medication is defined as any chemical substance intended for use in the medical diagnosis, cure, treatment, or prevention of disease. Medications are perhaps the most common intervention in health, providing palliative, symptomatic and curative treatment of diseases and conditions, and the opportunity for error in the use and administration process is significant. Thus, management of the six processes of medication includes selection and procurement, storage, ordering and transcribing, preparing and dispensing, administration, and monitoring becomes a vital aspect of patient care and safety.

Medication management, broadly defined, as the facilitation of safe and effective use of prescription and over the counter medicinal products (Bulechek and McCloskey, 1999). Medication management is a comprehensive intervention which encompasses the knowledge of nurses and midwives and that of other health care professionals and the activities that are performed to assist the patient in achieving the greatest benefit and best outcomes involving medications (Naegle, 1999).

The responsibilities of medication management incorporate the assessment, planning, implementation and evaluation of the nursing and midwifery process in collaboration with other health care professionals in providing care.

The nurse should have knowledge of the relevant standards and legislation regarding the practices of prescribing, dispensing, storing, supplying and administering medicinal products. This includes controlled, prescription-only and over the counter medications. There is an obligation to practice according to the legislation governing nursing and midwifery practice, and follow current standards and policies of regulatory bodies and health service providers. Nurses and midwives should be aware of their legal and professional accountability with regard to medication management. Naegle (1999).

Andrew (2010) conducted a study on medication errors occurring among acute patient's with cardiovascular and stroke. He found that medication errors are the eighth leading cause of death in US. Each year in US, the estimated 4,50,000 preventable medication related adverse events.

Medication error is the most common type of error affecting patient safety and is the most common single preventable cause of adverse events (National Medicines Information Centre, 2001). Medication errors are defined as preventable events that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional or patient.

A medication error is any event that could cause or lead to a client receiving inappropriate medication therapy or failing to receive appropriate medication therapy. (Potter 2005). These events may be associated with professional practice, health care products, procedures and systems. They include prescribing, order, communication, product labeling, packaging and nomenclature, compounding, dispensing, distribution,

administration, education, monitoring and use (National Coordinating Council for Medication Error Reporting and Prevention, 1998).

Medication errors can occur at any point in the medication management cycle. Most medication errors occurs when a nurse become distracted or fails to follow routine procedures such as checking dose calculations, deciphering illegible handwriting ,or administering medications with which the nurse is unfamiliar. Potter, (2005).

This study was done mainly by the investigator mainly to impart knowledge on medication management and to prevent medication errors. This study will be benefited to the patients by protecting them from fatal medication errors and improvement in their health status.

### **Need for the study**

Medication Management is the term used to describe the medication related therapies that is prescribed for a patient in a Hospital. It is the monitoring of medications a patient takes to confirm that the patient is complying with a medication regimen, while also ensuring the patient is avoiding potentially dangerous drug interactions and other complications. This is especially important for patients taking large numbers of medications to address chronic illnesses and multiple diseases.

There are a number of aspects to medication management, all of which are focused on making sure that medications are used appropriately. Keeping track of all of the medications currently in use by a patient is an important part of medication management. This can include creating printed lists describing medications, their

dosages, and how they are being used. These lists can be kept in patient charts and provided to patients to help them track the drugs they use and understand why various medications are being prescribed.

Shea (2009), emphasized that the drug administration is an integral part of the nurse's role. Responsibility for correct administration of medication rests with the nurse, yet medication errors are a persistent problem associated with nursing practice. Medication errors are a significant cause of morbidity and mortality in hospitalized patients. This creates an imperative to reduce medication errors to deliver safe and ethical care to patients. Brady, (2007).

Craven explores that the prevention of serious injuries to clients resulting from medical errors must be a high priority for healthcare professionals and institutions. The majority of medical errors do not result from individual recklessness but from basic flaws in the way the health care system is organized.

Wolf (2009), states that 3% of 1,305 student-made medication errors occurring in the administration process resulted in patient harm. Most were omission errors, followed by errors of giving the wrong dose of a drug. The most prevalent cause of the errors was students' performance deficits, whereas inexperience and distractions were leading contributing factors.

1.5 million preventable adverse drug events occur each year in the United States of 221,000 medication errors reported via MEDMARX 1998-2005 in a perioperative setting. About 80% of the medication errors that result in patient harm are caused by medications administered by practitioners. The leading medications involved are Insulin

– 11.3%, Morphine – 2.3%, Heparin – 3.5%, Fentanyl – 2.9%, Hydromorphone – 2.7%  
.Aspden (2006).

Barker (2002), Barker found that medication errors occur in nearly 1 out of every 5 doses given to patients in the typical hospital. Adverse medication events have been reported and are estimated to occur at a rate of around 5% for admissions and discharges from the typical hospital. Classen et al., (1997).

In the year 1995 Lesar conducted a study on the consequences of fatal medication errors for health care providers, using a secondary analysis study. The results showed that the serious error occurred in approximately 2 per 1000 prescriptions, adverse drug reactions accounted for 12 to 30%. It was estimated that 1000 medication errors occurs annually. This study indicates the need for medication management systems in the Hospital to incorporate steps to prevent medication errors.

The process of preventing medication errors is complex and involves several healthcare disciplines (Henry & Foureur, 2007). Nurses, pharmacists and physicians are all involved in the process of medication management of prescribing, preparing and administering. and each of these individuals could contribute to the potential for error. Physicians may write an incorrect dosage of medication, pharmacists may provide the wrong form of the drug, or nurses may administer the medication to the wrong patient.

Continuous quality improvement programs for monitoring medication errors and near misses should be in place within risk management systems of the organization. Fostering cultures of safety and continuing professional development in medication

management for nurses and midwives are important in preventing and addressing the causes of medication errors.

These studies clearly explore the occurrence of the medication errors and their impact on patient care. The goal of the researcher is to enhance the knowledge on medication management. An early introduction of an integrated approach to the teaching and assessing of pharmacological processes improves students' drug knowledge prior to qualification. A sound preparation will help to ensure safe and effective medication management care for patients and will prepare nurses for post graduate education and further training.

### **Statement of the problem**

A Pre experimental study to assess the effectiveness of capacity building on medication management among student nurses at Apollo College of Nursing-Chennai.

### **Objectives of the study**

1. To assess the existing level of knowledge, attitude and practice regarding medication management among student nurses.
2. To compare the effectiveness of capacity building on medication management among student nurses.
3. To inter-correlate the knowledge, attitude and practice regarding medication management among student nurses before and after implementation of capacity building program.

4. To determine the association between selected demographic variables and knowledge, attitude and practice of student nurses before and after implementation of capacity building program.

### **Operational Definitions**

#### **Medication**

In this study medication is the substance used as a therapy for the patients and which is administered through oral, intravenous, intramuscular, subcutaneous, intradermal vaginal and intraosseous routes.

#### **Management**

In this study management includes Selection, Procurement, Storage, Ordering and Transcribing, Preparation and Dispensing, Administration and Clinical monitoring of effects of the medication given.

#### **Knowledge**

In this study, it refers to the level of information of the student nurses on medication management as measured by a structured questionnaire.

#### **Attitude**

In this study it refers to the perception of student nurses regarding medication management as measured by rating scale.

#### **Practice**

It refers to the skill of student nurses on medication management measured using a checklist.

### **Student Nurses**

In the study, it refers to the student nurses who are studying in the III year B.Sc. Nursing in Apollo College of Nursing.

### **Capacity Building on Medication Management**

In this study the capacity building program refers to providing information regarding medication management.

### **Effectiveness**

In this study it refers to the outcome of the capacity building upon the knowledge, attitude and practice of student nurses on medication management in terms of differences in scores between the pre and post tests.

### **Assumptions**

The study assumes that,

- One of the leading causes of adverse reactions and death in the hospitals is medication error.
- High incidences of medication errors are due to lack of knowledge and negligence.
- Nurses can use cooperative learning as an effective method of teaching the other student nurses on medication management.
- Capacity building develops knowledge and skill regarding medication management.



### **Null Hypothesis**

- Ho1:** There will be no significant relationship between pre and post test knowledge, attitude and practice scores of student nurses on medication management
- Ho2:** There will be no significant correlation between knowledge, attitude and practice of student nurses on medication management
- Ho3:** There will be no significant association between selected demographic variables and knowledge, attitude and practice of student nurses on medication management

### **Delimitations**

The study is limited to

- The student nurses who are studying in Apollo college of Nursing Chennai.
- Student nurses who are posted in the day shift.
- Student nurses who are willing to participate.

### **Conceptual Framework**

The conceptual framework deals with the interrelated concepts that are assembled together in some rational schemes by virtue of their relevance to a common theme (Polit and Beck, 2004). Basic to any professional discipline is the development of a body of knowledge that can be applied to its practice. Such knowledge is often expressed in terms of concepts.

A concept is a generalized idea of some group of the objects or an abstract idea generalized from several specific instances. Conceptual framework is a process of ideas,

which are formed and utilized for the development of research designs. It helps the researcher to know what data needs to be collected and gives direction to an entire process.

The conceptual theory for the present study is based on J.W.Kenny's open system model. All living systems are open, in which there is a continual exchange of matter, energy and information. Open system have varying degrees of input and gives back output in the form of matter, energy and information.

The concepts of Kenny's open system model are input, throughput, output and feedback. Input refers to matters and information, which are continuously processed through the system and released as outputs. After processing the input, the system returns to output to the environment in an altered state, affecting the environment for information to guide its operation. This feedback information of environment to the system's output is used by the system in adjustment with the environment. Feedback may be possible, negative or neutral. In this study concepts have been modified as follows.

### **Input**

In the present study the input was the demographic variables of student nurses.

### **Throughput**

Throughput was the process of conducting capacity building program on medication management.

**Output**

The expected outcome is obtained by the post assessment of knowledge attitude and practice regarding medication management after the capacity building program.

**Feedback**

It is assessed by comparison of pre and post assessment of knowledge, attitude and practice regarding medication management with a structured questionnaire, rating scale and performance checklist to assess the level of knowledge, attitude and practice on capacity building in medication management.

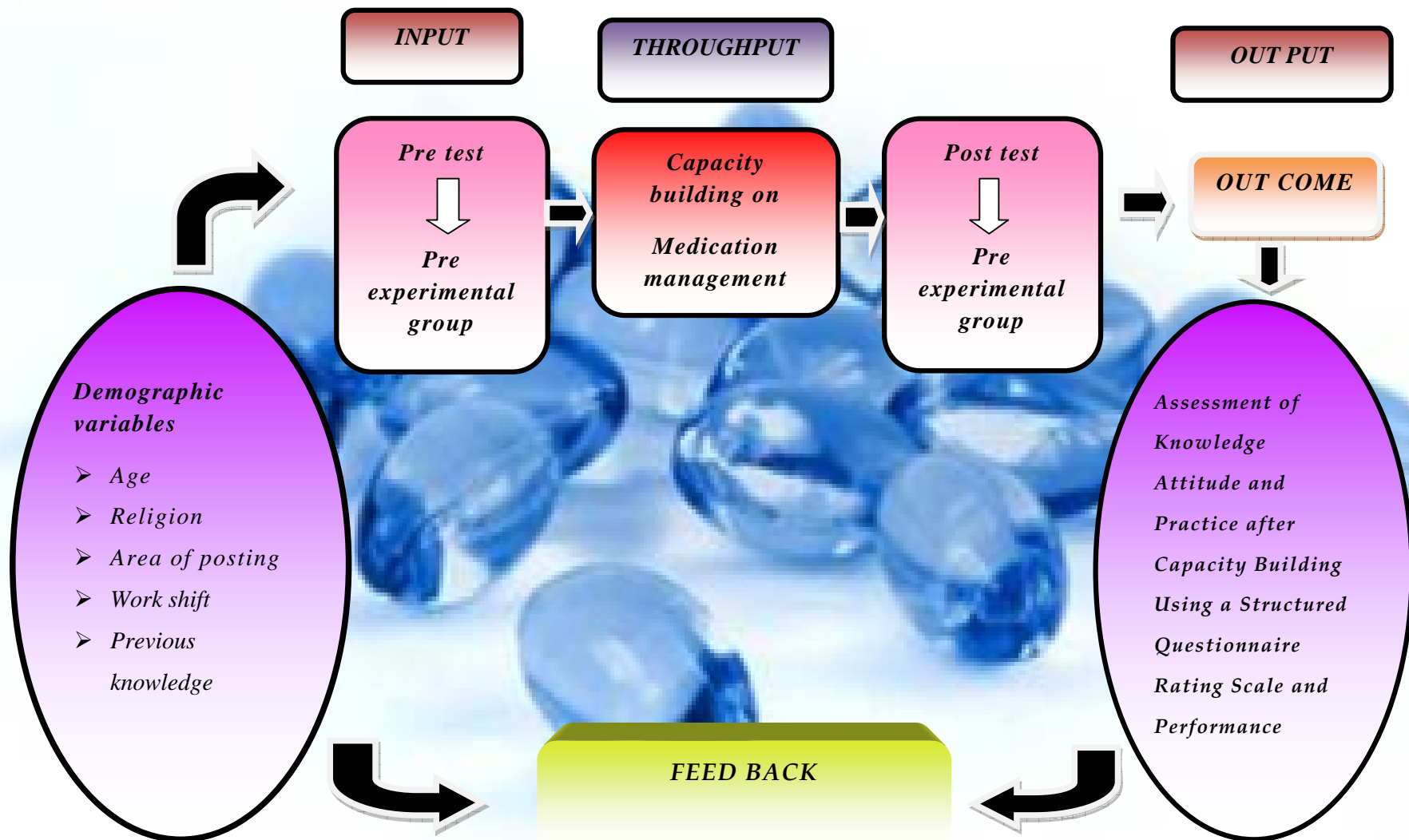


Fig. 1. Modified Conceptual frame work of S.W. Kenny's open system model

### **Projected outcome**

There will be a significant improvement in the level of knowledge, attitude and practice in the pre test and post test after capacity building program on medication management among student nurses.

### **Summary**

This chapter dealt with the background of the study, the need for the study, statement of the problem, objectives, assumptions, operational definitions, null hypothesis, delimitations and conceptual framework of the study

### **Organization of the report**

Further aspects of the study are presented in the following chapter

- Chapter II** : Review of literature
- Chapter III** : Research methodology
- Chapter IV** : Analysis and interpretation
- Chapter V** : Discussion
- Chapter VI** : Summary, Conclusion, Implications, Recommendations

## **CHAPTER - II**

### **REVIEW OF LITERATURE**

Review of literature is an essential component of the research process. It is critical examination of a publication related to a topic of interest. Review should be comprehensive and evaluative. Review of literature helps to plan and conduct the study in a systematic manner.

The task of reviewing literature involves the identification, selection, critical analysis and written description of existing information on the topic of interest.( Polit and Beck , 2004).

The review of literature in this chapter is presented under the following headings.

- **Studies related to medication errors.**
- **Studies related to the capacity building on medication management.**
- **Studies related knowledge, attitude and practice on medication management**

#### **Studies related to medication errors**

Tamer in the year 2010 explored that millions have been victims of medication errors. The Institute of medicine estimates that preventable medication errors result in more than 7,000 deaths each year in hospitals alone and tens of thousands more in outpatient facilities.

In the year 2008 the Joint commission international organization emphasized the nurse's role in medication safety preventing medication errors. The vital steps to prevent medication errors are by addressing repetitive error patterns, working with other nurses, pharmacists, and physicians as partners in medication safety, encouraging nurses to report medication errors, by using human factors engineering solutions to help nurses improve medication safety, using technology such as smart pumps and computerized prescriber order entry to help nurses improve medication safety.

Koppel (2008), discussed the medication error risks generated from physician order entry. The result of the quantitative and qualitative study from a large tertiary hospital indicated that computerized physician entry system impacted on 22 types of medication error risk. He also found that the emergency setting is uniquely prone to medication error Patient weighing is frequently based on approximation and medication conversion requires math skills and appropriate placement of decimal points emergent situation often allows little time for double checking medication dosage which can result in adverse drug reactions.

The major concern for patient safety in hospital is accurate medication administration. To improve the medication administration process nurse and pharmacist must report system problems. A study was conducted on 'Effective strategies to increase reporting of medication errors in the hospital. USP reported that the ten most commonly reported medication error were Performance deficit 38%, Policy procedure not followed 20%, Transcription inaccurate /omitted 15%. Documentation 12%, Computer entry 11%, Knowledge deficit 10%, Communication 10% Written order 6% Drug distribution system 4%, Illegible handwriting 3%. Vanoyen et al., (2006),

Petrick (2006), presents the findings of a retrospective review of medication errors made and reported by nursing students in a 4-year baccalaureate program. Data were examined in relation to the semester of the program, kind of error according to the rights of medication administration, and contributing factors. Three categories of contributing factors were identified: rights violations, system factors, and knowledge and understanding.

In the year 2006 Petrick emphasized that it became apparent that system factors, or the context in which medication administration takes place, are not fully considered when students are taught about medication administration. Teaching strategies need to account for the dynamic complexity of this process and incorporate experiential knowledge. This review raised several important questions about how this information guides our practice as educators in the clinical and classroom settings and how we can work collaboratively with practice partners to influence change and increase patient safety.

Jean (2006), conducted a study on Non punitive medication error reporting to identify underlying practices and attitudes on medication error occurrences and reporting practices. A pre and post initiative questionnaire to measure staff practices and attitudes on medication error reporting was developed and administered. The study concluded that staff perception that medication error reporting carries the risk of disciplinary action was identified as a primary barrier to the likelihood of reporting sample.



In the year 2005, Burke identified seven significant barriers to safe medication administration. They are lack of interdisciplinary teamwork and efforts, fluctuations in staffing patterns and use of abbreviations were identified with the seven barriers. Delays in responding to safety concerns and system flaws within the health care environment also influenced the safe administration practice. Burke also identified recent research that has examined the negative impact of nursing staff working over 12 hours shift working over or 40 hours /week and the increase risk of medication errors.

A study was explored that the Standard protocols for medication administration may reduce nurse related errors and signage placed in medication preparation areas may reduce interruption by others that interfere with the nurse's focus when preparing medications for administration. Pape, (2005).

Helen et al., (2004), concluded that the computerized medication system and bar coding of medications are system safeguards that have been demonstrated to be effective in reducing medication errors rates.

A cross sectional descriptive study on prescription and dispensing accuracy among independent and health system pharmacist was done. For 100 prescriptions dispensing errors identified were 4 errors per day in a pharmacy filling 250 prescriptions, An estimated 51.5 million error occurred during the filling of 3 billion prescriptions each year. The study concluded that there is still more medication errors in prescribing and dispensing medications. Lynn (2003).

In the year 2002 Neonatal and pediatric pharmaceutical group. conducted a study on unlicensed drug used in children which were likely to be associated with

medication errors. It is estimated that 7% of all prescriptions in pediatric wards are unlicensed use. It comprised of about 12% and prescribing, 25% in dispensing and 17% overall. Unlicensed drug use in neonates is associated with errors. By the administration 26% of error occurred and 83% occurred during dispensing. Overall neonatal error occurred for 10%. In children 4% in prescribing, dispensing error accounts for 25% and overall 10%, 13% of error caused moderate harm. 60% of unlicensed errors accounted by personnel and off label drugs were also detected.

In the USP study of Santell (2002) found that Potential errors were 9.7% of the total submitted errors, leaving a remaining 91.3% being actual medication errors. Patients were not harmed by 97% of actual errors. Death resulted from medication error at a rate of 0.61%. The results showed that the medication error can cost the life of the patients.

The debate on preventing medication error made national public headlines after the national institute of medicine released their landmark findings in two separate reports titles 'To err is human, Building a safer health system and crossing the quality chasm. The institute of medicine (IOM) defines an error as 'The failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim' Craven et al. (IOM 1999).

Following this report medication error was linked with flawed healthcare system within practice settings. However regardless of the system issues, the attention quickly shifted to mathematical competence of professional nurses.

Fall (1999), explored that the institute of medicine (IOM) released its grand breaking report that in US, the deaths due to medication error were between 44,000 – 98,000. The strategies developed were, they should establish and maintain a functional pediatric formulary system with policies for drug evaluation, selection and therapeutic use. Standardize equipments throughout the institution such as infusion pump and weight scales. Standardized measurement systems throughout the institution used for patients example only kilogram for weight rather than pounds.

Standardize order sheets including area for patient weight, old and new allergy, prescriber's name, signature and contact number were reasonable computerized system to check dose and dosage schedules, drug interactions, allergies and duplicated therapies. Provide a suitable work environment for safe and effective drug preparations.

According to Bates in the year 1996, a case study was published by hospital pharmacy with the error stating that an infant was suspected of having congenital syphilis was treated with ten times the amount of medication that was ordered by physician. The order was 150, 000 U.I.M. yet the patient received 1,500.000 U IV. This study reveals the inadequacy of the nurse's knowledge.

### **Studies related to capacity building on medication management**

In the year 2010 a quasi-experimental study was conducted to identify registered nurses' knowledge of medication management and adverse drug reactions in the elderly in aged care facilities. The results showed that Pre-test showed knowledge deficits in medication management and adverse drug reactions in the elderly, the post-test showed

statistically significant improvement in knowledge. The study recommended increasing the knowledge among nurses on medication management. Lim and Chiu.

The Joint Commission (JC) reaffirmed the need to prevent medication errors in their patient safety goals for 2009. The standards mandated are increasing the accuracy of patient identification, enhancing the effectiveness of communication among caregivers, and improving the safety of medication administration (JC. 2009).

An experimental study on numeracy for nursing creating a benchmark by Coben (2008), showed that the nurses demonstrated achievement, and promoted patient safety and good critical judgment in calculating the doses. The researcher found that the continuous teaching programs can improve the knowledge and skills on medication management. Coben (2008).

Gates et al., (2008), conducted a descriptive study among nurses 41 nurses on medication improvement. The results showed that there was a significant improvement in medication knowledge. The study concludes that the nurse educators should focus on continuing education on medication management.

In the year 2008, Atiken conducted an analytical study to examine how graduate nurses document their medication management in the progress notes. A prospective clinical audit of patient medication charts and the progress notes of 12 nurses. Documentation was examined based on four areas such as assessment, planning care, administration of medications, and evaluating outcomes of medications. Evaluation of outcomes of medication administration was poorly documented. Adopting a supportive

multidisciplinary approach to quality improvement and providing education on medication management in order to prevent medication related errors.

Craven (2007), stated that the IOM (institute of medicine) as well as accrediting agencies (JCAHO) and professional organizations such as the Institute for healthcare improvement (IHI) and the Institute for safe medication practice (ISMP), are emphasizing the top priority efforts within institutions to design systems geared to preventing, detecting and minimizing hazards and the likelihood errors.

In the year 2006 a qualitative descriptive study on application of pharmacology knowledge in medication management by final year undergraduate nursing students at New Zealand. Pharmacology knowledge is integrated into practice during medication administration, formulation, dosing and client education. The study concluded that a student workbook that would draw on both clinical and theoretical activities as different aspects of pharmacology knowledge are applied, as well as increasing the knowledge on medication management can enable the students to apply both theoretical and practical knowledge. Honey et al.,

A descriptive study to identify how pharmacy faculty members are addressing the issue of medication management in primary or secondary schools in their teaching, research, and service activities, and to ascertain the extent to which they think the issue is an important one at University Chicago College of Pharmacy. The results showed that only 33 subjects (6.6%) addressed the topic of medication management in schools in their courses; only 13 (2.6%) conducted the research on the topic; and only 30 (6%) were involved in service in this area. The study concluded that there is a large gap

between the number of subjects that think medication management in schools is an important topic and the number who actually include the topic in teaching, research, and or service. Reutzel (2006).

In the year 2006, Gray conducted a pre experimental study on community health nurses on management package in improving compliance and clinical outcomes in patients with schizophrenia for 10 weeks. The results showed that the medication management training produced a significant improvement in patients with schizophrenia ( $p < 0.001$ ). The study inferred that education can improve the knowledge on medication management.

Wright (2005), An International research capacity-building programs for nurses to study the drug phenomenon was explored in Latin America among nursing students. In evaluating the overall program, the program fostered a global health perspective on the drug phenomenon among the nurses who participated in the program and increased the knowledge regarding drug phenomena.

A qualitative research design was conducted on medication management by graduate nurses before, during and following medication administration was done at Australia. Two major themes emerged that the monitoring medications and interventions for patient care. The study concluded that graduate nurses are required to address several facets of the medication management role in their daily practice. Collegial support, graduate nurses should also be encouraged to critically examine the different possibilities when making clinical judgments about monitoring patient medications. Dunning, (2004).

Colin (2003), aimed at conducting a qualitative research design with a semi structured interview schedule to explore graduate nurse perception of their medication management activities in the acute care context. The sampling population consisted of samples who were directly involved in patient care. The major theme emerged was monitoring medication and exploring knowledge on medication management.

In the year 2002, Merdith conducted an experimental study on medication program to identify potential medical problems and collaboration with clinical pharmacist and 130 nurses were selected for the study. The study result showed that the educational interventions were most effective in preventing therapeutic duplication and preventing medication errors.

#### **Studies related knowledge, attitude and practice of nurses**

Happell (2010), conducted a study to examine the factors that influence the experiences of final-year undergraduate nursing students when administering medications in the clinical setting using semi-structured interviews. Three main factors were identified as influencing the supervision provided by registered nurses attitudes of the registered nurse, communication from the university, and busyness and having time. The study concluded that the factors influencing the supervision provided by registered nurses needs further exploration that effective strategies can be implemented to ensure safe practices in relation to medication administration can be implemented.

Meechan (2008) conducted an experimental study to investigate the efficacy of a 14-month integrated pharmacology and medicines management curriculum for undergraduate nursing students on the acquisition of applied pharmacology knowledge.

The first group were exposed to the usual curriculum control group the second group experienced a new integrated pharmacology and medicines management curriculum. The results showed that the students exposed to an integrated approach to pharmacology and medicines management demonstrated superior pharmacokinetic knowledge and were more able to apply drug knowledge to the patient vignettes than the control group.

In the year 2005, Searl conducted a study among undergraduate nursing students' experience of administering medication in the clinical setting using a grounded theory methodology. The participants acknowledged the need for supervision according to the following sub-themes: a university requirement; scope of practice; and safety of the five rights and adequate supervision is provided during safety to ensure safe practices.

A pilot study was done to determine whether using dimensional analysis as the method of mathematical computation could reduce nursing medication calculation errors. The sample for this study consisted of second-year baccalaureate nursing students in a required clinical skills course. Students in the control group were taught medication calculations using the traditional math method during one semester, whereas students in the experimental group were taught the same material using dimensional analysis during the next semester. Analysis of the collected data from a medication dosage calculation examination revealed the dimensional analysis group scored with greater accuracy than the traditional math group. This reveals that proper training can reduce medication errors. Greenfield (2009).



In the year 2003, Wallace conducted a study to assess the effectiveness of teaching baccalaureate nursing students to prevent medication errors using a problem-based learning approach. This reinforcement, combined with a focus on increasingly complex pharmacological agents and medication calculations, enables students to employ critical thinking skills and develop the confidence necessary for safe, professional practice.

Banning (2003), discussed how structured assessments, practical skills and performance indicators can be used to assess the ability of pre-registration nursing students' to analyze and clinically apply the theoretical principles of pharmacology and therapeutics pertinent to medication management. The assessment strategy specifically aims to reinforce the development of clinical reasoning with regard to medication management and supports the need to prepare nurses to become multi-skilled professionals who can meet the challenges of nursing. Learning through practical assessments can enhance the marriage between the integration and synthesis of research evidence and the application of propositional and process knowledge forms to nursing care.

King (2000), explored nurses' pharmacology education needs by identifying nursing roles that require pharmacology knowledge and nurses' preparation for practice from pre-registration pharmacology education. A qualitative approach was used to collect data through structured interviews. This study revealed a limited understanding of the subject, and dissatisfaction with the teaching of pharmacology, with resulting anxiety on qualifying. Nursing roles identified as requiring pharmacology knowledge included drug administration, patient assessment, nurse prescribing, and patient

medication education. The findings suggest that, although nurses have a limited understanding of pharmacology, they recognize the need for pharmacology knowledge in practice.

### **Summary**

This chapter dealt with the review of literature .This review of literature helps to obtain in depth knowledge on medication management among nurses effectiveness of capacity building program on medication management and medication errors. The literatures presented here were extracted from 29 Primary sources and 8 Secondary sources.

## **CHAPTER - III**

### **RESEARCH METHODOLOGY**

The methodology of the research study is defined as the way the data is gathered in order to answer the question or analyze the research problem. It enables the researcher to project the blue print of the research undertaken.

The present study was conducted to assess the effectiveness of capacity building on medication management among student nurses.

The chapter deals with a brief description of different steps undertaken by the researcher for the study. It involves research approach, the population, setting, sample and sampling technique, selection of the tool, content validity, reliability, pilot study, data collection procedure and plan for data analysis.

#### **Research Approach**

Research approach is the most significant part of any research. The appropriate choice of the research approach depends on the purpose of the research study which is undertaken. According to Polit and Beck (2004) evaluative research is an extremely applied form of research and involves finding out how well a program practice of policy is working. Its goal is to assess or evaluate the success of the program. In this study as the researcher would like to assess the gain in knowledge after the capacity building on medication management among student nurses. The pre experimental approach seemed to be the most appropriate approach.

## **Research Design**

A research design incorporates the most important methodological design that a researcher works in conducting a research (Polit and Beck,).

A pre experimental type of one group pre test and post test design was adopted for conducting the study. In this study the researcher administered a pre test knowledge questionnaire, rating scale for attitude and performance checklist for the selected student nurses and she manipulated the independent variable, i.e. teaching on capacity building on medication management was administered to the student nurses for two hours using power point presentation. Then the post test was conducted after one week apart. Finally the effectiveness of capacity building on dependent variable i.e. knowledge, attitude and practice of student nurses was computed by post test.

The research design is represented diagrammatically as follows.

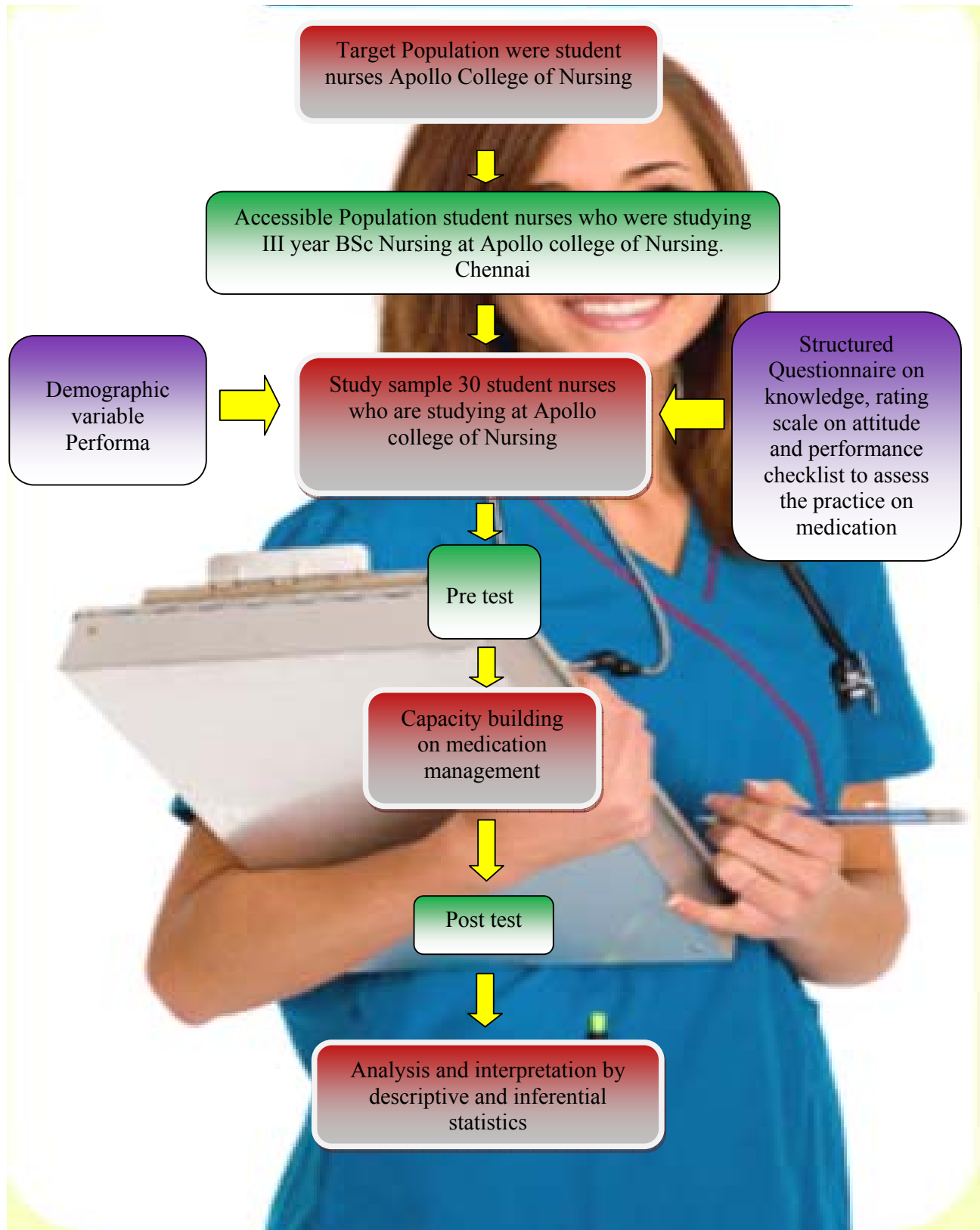
One group pre and post test design

O 1 X O2

O 1 – Pretest for the assessment of existing knowledge, Attitude and Practice of student nurses on medication management.

X – Administration of capacity building on medication management for student nurses.

O 2 – Post test for the assessment for improvement in Knowledge, Attitude and Practice after the capacity building program on medication management.



**Fig: 2 Schematic diagram of the Research Design**

## **Research Setting**

The physical location and conditions in which data collection takes place in a study. (Polit and Hungler, 1999).

The present study was conducted at Apollo College of nursing. which is located at Ayanambakkam in Chennai, 20 km away from central railway station. Apollo College of Nursing is a unit of Apollo Hospitals Groups, comprising of good faculty team, well equipped library, laboratories, other clinical facilities and hostel facilities which contributes to overall personality development of the student. It conducts various nursing programs like M.Sc., (N)., B.Sc., (N) with an intake of 24,100.25 students respectively. It also conducts various certificate and short term courses periodically as per needs.

## **Population, Sample and Sampling Technique**

According to Polit and Hungler (2004) a population is an aggregate of totality of all subjects that possess a set of specifications. The target population is the population that the researcher aims to study and to whom the study findings will be generalized. The target population of the present study were the student nurses who are studying in Apollo college of nursing- Chennai.

Accessible population is the population that the researcher finds in his/her study area. The accessible population in this study were the student nurses who were studying III year B.Sc Nursing at Apollo College of Nursing, Chennai

Polit and Beck, (2004) stated that a sample consists of a subset of the units that comprises the population.

Sample size for the present study were 30 student nurses who satisfied the inclusion criteria, were selected.

### **Sampling technique**

It was stated by Polit and Beck, (2004), sampling is the process of selecting a portion of the population to represent the entire population. The participants for the present study were selected by purposive sampling technique in which the researcher selects participants based on the inclusion criteria.

### **Sampling criteria**

#### **Inclusion criteria**

- The study included the nurses who were studying III year B.Sc Nursing at Apollo College of Nursing
- The study included the student nurses who were willing to participate
- The study included the nurses who knew to read and write English.

#### **Exclusion criteria**

The study excluded

- The student nurses who were studying first, second and fourth year B.Sc Nursing.
- The student nurses who were not willing to participate
- The student nurses who were on night shift during the study

### **Selection and development of study instrument**

As the study aimed at evaluating the effectiveness of capacity building in medication management, the data collection instruments and the information in the capacity building program were developed through an extensive review of literature, consultation with experts and opinion of faculty members.

The researcher developed a demographic variable Performa, structured questionnaire to assess the level of knowledge and rating scale to assess the level of attitude and performance checklist to assess the practice of student nurses on medication management.

#### **Demographic variable Performa**

Demographic variable Performa consisted of structured questionnaire on medication management. The structured questionnaire was prepared carefully considering the language, clarity, organization and sequence of items. The questions were selected, and four options were given below each question. The structured questionnaire consisted of 25 multiple choice questions on knowledge regarding medication management. Each question had four options which included the right answer. The participants were free to choose any options for each question every correct answer was assigned a score of '1' and wrong answers a score of '0'. The total score of structured questionnaire was 25. The knowledge score were classified into 3 levels.



<b>Percentage</b>	<b>Level of knowledge</b>
$\leq 50 \%$	inadequate knowledge
51- 75 %	moderately adequate knowledge
$\geq 76 \%$	adequate knowledge

Level of attitude of the student nurses on medication management consists of 10 statements. The total score was 50.

<b>Percentage</b>	<b>Level of Attitude</b>
$\leq 50 \%$	Low Attitude
51 – 75 %	Moderate Attitude
$\geq 75 \%$	High Attitude

Level of Practice of the student nurses on medication management consists of performance checklist on oral, intravenous, intramuscular and subcutaneous medication

<b>Medication</b>	<b>Level of Practice</b>
$\leq 50 \%$	Inadequate Practice
51 – 75 %	Moderately Adequate Practice
$\geq 75 \%$	Adequate Practice

### **Validity of study instruments**

The constructed tool was given to seven experts in the field of child health nursing. One of the experts was a Doctor and seven were nursing personnel. Validator had suggested some specific modifications in the knowledge questionnaire and level of

satisfaction. The modifications and suggestions of experts were incorporated in the final preparation of structured questionnaire on knowledge and rating scale to assess the level of attitude and performance checklist to assess the practice on medication management.

### **Reliability of study instruments**

The reliability of the study instruments was used with ten samples with purposive sampling technique. The study sample was divided into odd and even numbers and the reliability was assessed with split half reliability method and the reliability was high.

### **Development of capacity building in medication management**

A structured teaching plan was prepared by the investigator. The power point presentation was shown to the experts in the field of child health nursing and obstetrical and gynecological nursing for establishing content validity. The sequence of the power point presentation was modified as per the expert's advice. The teaching plan included the topics regarding JCIA Medication management standards and its sub standards like Selection, Procurement, Storage, Ordering and Transcribing, Preparation and Dispensing, Administration and Clinical monitoring of effects of the medication given.

### **Pilot study**

Polit and Beck, (2004) state that a pilot study is a miniature of some parts of the actual study, in which the instruments are administered to the subjects drawn from the same population. It is a small scale version done in preparation for a major study. After obtaining permission from the authorities, a pilot study was conducted on nurses

working in Apollo children Hospital, Chennai. The purpose was to find out the feasibility and practicability of the study design. The subjects were chosen by purposive sampling technique. A pre test followed by a capacity building program on medication management and a post test after one week were conducted. Participants have taken time of 30 minutes for each nurse. On the whole, the structured questionnaire, level of satisfaction scale and the capacity building program were found to be feasible and easy to understand by the nurses.

### **Intervention Protocol**

The study was done at Apollo College of Nursing – Chennai. Pre test on assessment of Knowledge , Attitude and Practice was done on (13-12-2010 and 14-12-2010) following that Capacity building program was conducted on 15-12 2010 for 30 student nurses for 1 hour and exactly after one week post test was done to assess the knowledge, attitude and practice of student nurses between 22-12-2010 to 23-12 -2010).

### **Data collection procedure**

Data collection is the gathering of information needed to address a research problem. Prior to the data collection, attempts were made to build a rapport with the concerned authorities. The present study was conducted at Apollo College of Nursing, Chennai. Thirty student nurses were selected by using convenient sampling technique. Since the study is primarily concerned with the assessment of effectiveness of capacity building program on medication management, pre test was conducted with the help of a structured questionnaire to assess the knowledge, a rating scale to assess the attitude and checklist to assess the practice of student nurses on medication management.

The capacity building program was conducted for the duration of two hours. The data was collected from (13-12-2010 - 23-12-2010). The pre-test data was collected and capacity building program on medication management was done after one week, post test was conducted for the same sample with the knowledge assessment questionnaire and rating scale on level of attitude and performance checklist to assess the practice on capacity building in medication management. The student nurses cooperated well.

### **Problem faced during data collection procedure**

- The student nurses were busy during the phase of data collection
- Some student nurses were not cooperative
- The session needed extra time for discussion and interaction with the nurses.

### **Plan for data analysis**

Data was analyzed using descriptive and inferential statistics. Data analysis included chi-square test, 't' test, mean, standard deviation and Pearson correlation.

### **Summary**

This chapter dealt with the research methodology. It includes research approach, research design, research setting, population, sample, and sampling technique used in this study. The selection and development of study instruments, validity and reliability of the study instruments, development of capacity building in medication management, pilot study, data collection procedure, problem faced during data collection, plan for data analysis and summary.

## **CHAPTER – IV**

### **ANALYSIS AND INTERPRETATION**

In this chapter the data collected from nurses to determine the effectiveness of capacity building on medication management are presented. The data were analyzed based on the objectives and hypothesis of the study. Data analysis was done manually after transferring the collected data into a master coding sheet by the researcher using descriptive and inferential statistics.

#### **Organization of findings**

The analysis of the data was organized under the following heading

- Frequency and percentage distribution of selected demographic characteristics of student nurses
- Comparison of mean and standard deviation of knowledge, attitude and practice scores of student nurses before and after the capacity building on medication management
- Dimensional analysis of knowledge score of student nurses on various aspects on medication management
- Correlation between knowledge and attitude of student nurses on medication management in Pre test and Post test
- Correlation between knowledge and Practice of student nurses on medication management in pre test and post test
- Correlation between attitude and Practice of student nurses on medication management in pre test and post test

- Association between selected demographic variables and level of knowledge of student nurses after capacity building program on medication management in Pre test
- Association between selected demographic variables and level of knowledge of student nurses after capacity building program on medication management in Post test
- Association between selected demographic variables and level of attitude of the student nurses after capacity building program on medication management in Pre test
- Association between the selected demographic variables and level of attitude of student nurses after capacity building program on medication management in Post test
- Association between selected demographic variables and level of Practice of student nurses after the capacity building program on medication management in Pre test
- Association between selected demographic variables and level of Practice of student nurses after the capacity building program on medication management in Post test

**Table 1**

**Frequency and percentage distribution of selected demographic characteristics of student nurses.**

**(N=30)**

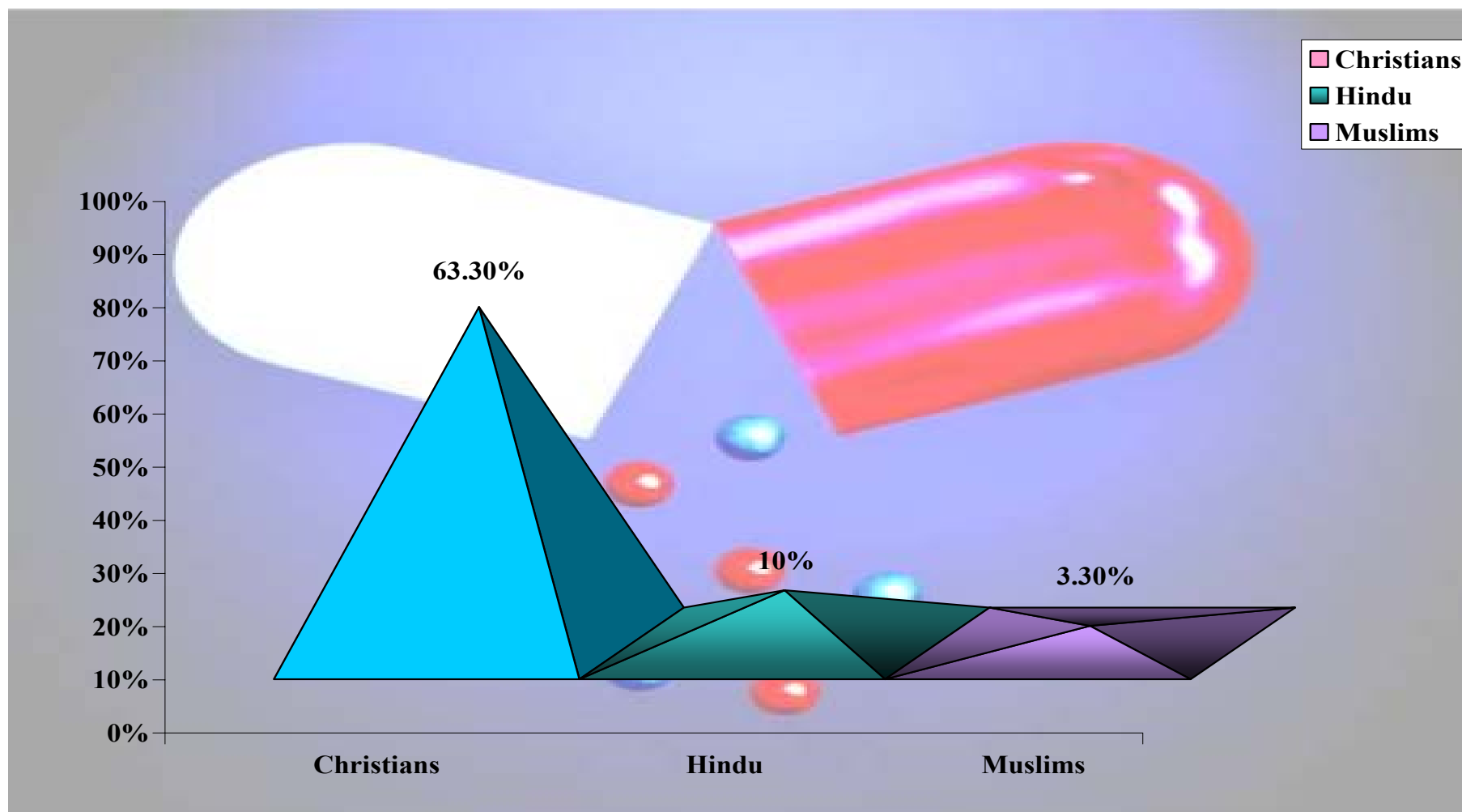
Demographic variable	Experimental group	
	n	p
<b>Age in years</b>		
18-19	5	16.7
19-20	24	80
>21	1	3.3
<b>Work shift</b>		
Day shift	30	100
Night shift	-	-
<b>Previous knowledge</b>		
Yes	-	-
No	30	100

The data from the above table reveals that majority of the student nurses (80%) belonged to the age group of 19-20 years of age. All the nurses were on day shift and all the student nurses have previous knowledge on medication management.

**Fig 3:** represents that most of the student nurses (63.3%) were Christians of the student nurses (10%) were Hindus and only 3.3 % were Muslims.

**Fig 4:** depicts that significant 53.3% of the student nurses were posted in medical ward during the study. The student nurses posted in other wards were about 8% and only 6% of the student nurses were posted in surgical ward.





**Fig. 3 Percentage distribution of religion of student nurses**

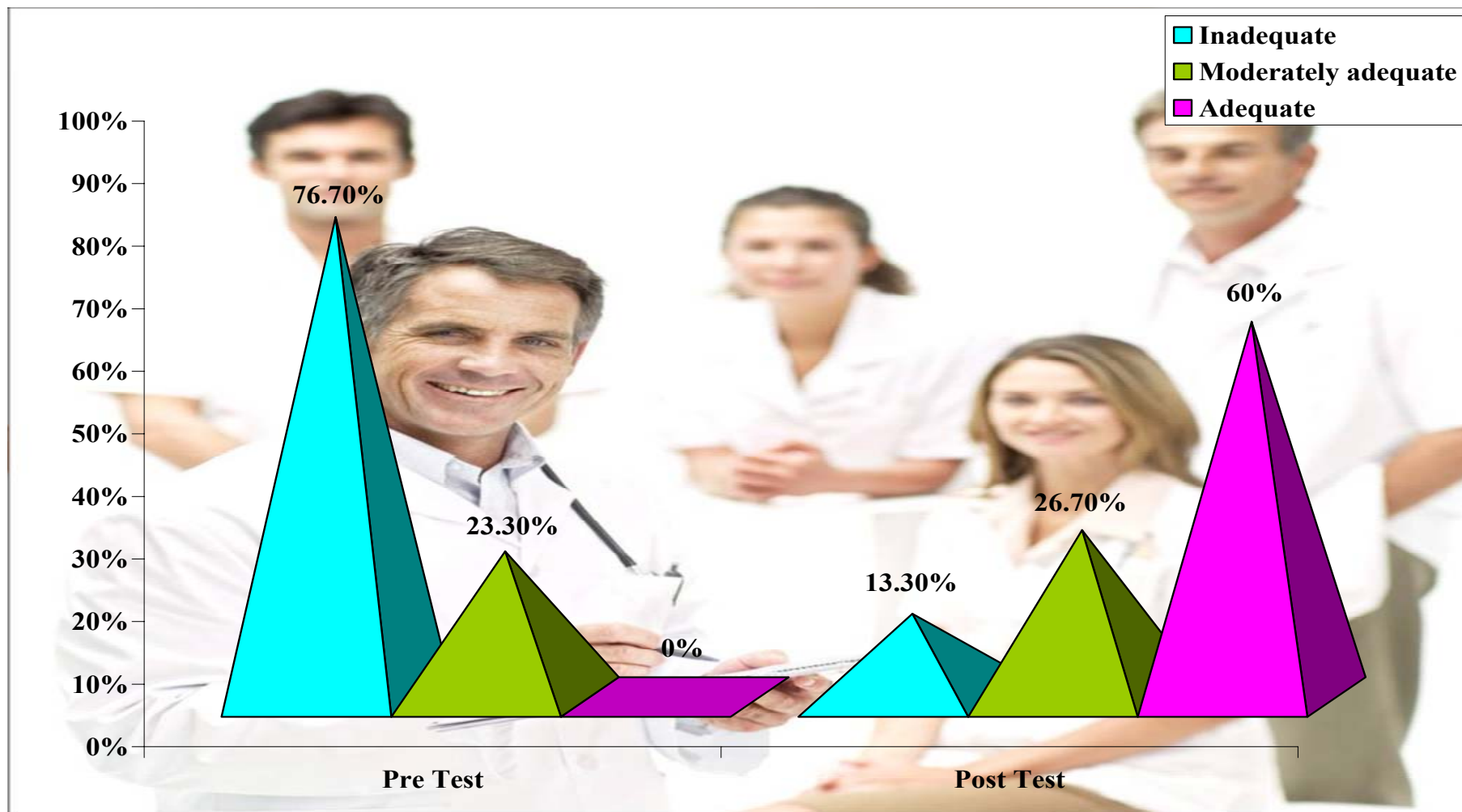


**Fig.4 Percentage distribution of area of posting of student nurses**

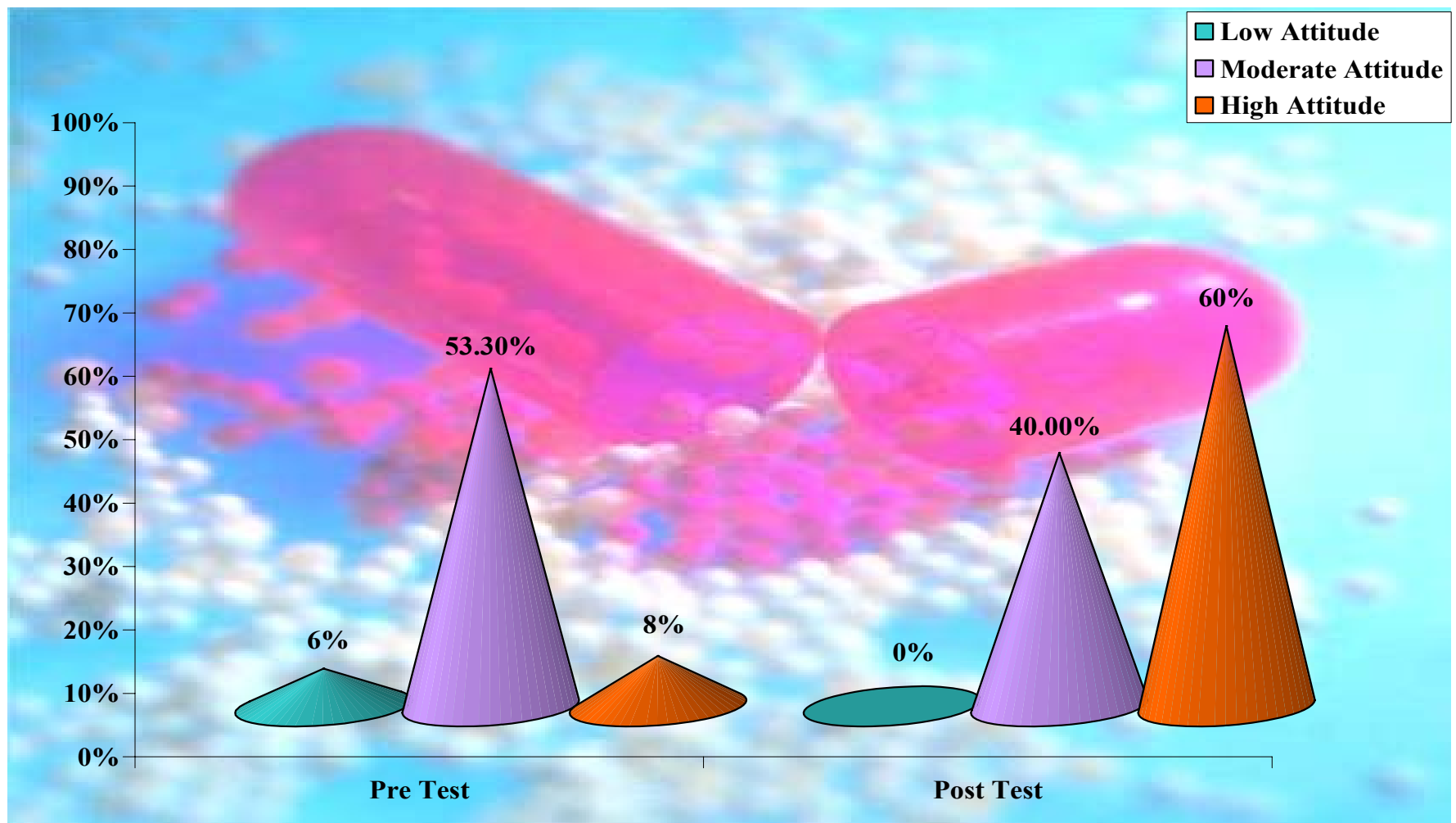
**Fig 5** It can be inferred from the figure that a majority of the student nurses (76.7%) in the pre test had inadequate knowledge, whereas in the post test (60%) of the student nurses shown statistically significant improvement in knowledge scores. Hence the null Hypothesis  $H_0$  was rejected

**Fig 6** reveals that most of student nurses (53.3%) had moderate attitude and (8%) of the student nurses had high attitude, (6%) of the students nurses had low attitude in the post test a most of the student nurses (60%) had high attitude this reveals the improvement in the level of attitude and about (40%) of the student nurses had moderate attitude.

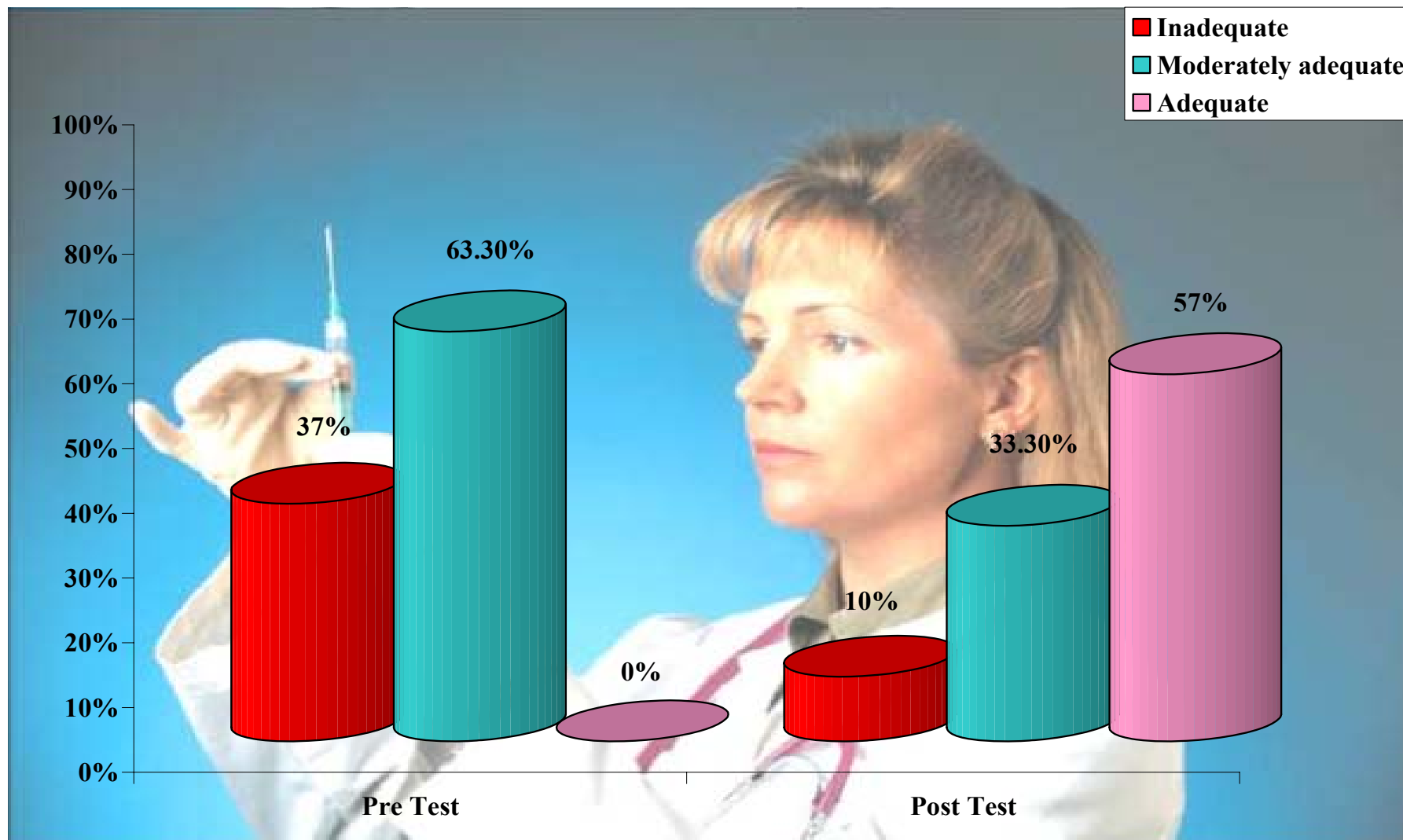
**Fig 7** reveals that a most of the student nurses (63.3%) in the Pre experimental group had moderately adequate practice and (11%) of the students had inadequate practice. and a most (56.7 %) improvement in the level of practices and (33.3%) have shown moderately adequate practice. and only (10%) of the student nurses had inadequate practice in the post t est.



**Fig.5 Percentage distribution of Level of Knowledge in Pre and Post Test**



**Fig.6 Percentage distribution of Level of Attitude in Pre and Post Test**



**Fig.7 Percentage distribution of Level of Practice in Pre and Post Test**

**Table 2**

**Comparison of mean and standard deviation of knowledge scores of student nurses before and after capacity building on medication management**

**(N=30)**

<b>Variables</b>	<b>Mean</b>	<b>S.D</b>	<b>‘t’ value</b>
<b>Knowledge</b>			
Pre test	10.87	2.945	9.297*
Post test	17.80	3.718	
Improvement Score	6.9333	0.773	
<b>Attitude</b>			
Pre test	33.30	6.849	5.810*
Post test	38.33	4.604	
Improvement Score	5.03	2.245	
<b>Practice</b>			
Pre test	12.40	2.848	8.280*
Post test	17.30	3.239	
Improvement Score	4.9	0.391	

\*p<0.05

The data from the above table shows that the mean knowledge score of student nurses in the pre test was (M=10.87; SD=2.945) and in the post test (M= 17.80; SD=3.718) which is statistically significant with the ‘t’ value of 9.297 (p<0.05).

The mean attitude score of student nurses in the post test was ( $M=38.33$ ;  $SD=4.604$ ) when compared to pre test value of ( $M= 33.30$ ;  $SD=6.849$ ) with 't' value of 5.810 ( $p<0.05$ ) which is statistically significant.

The mean practice score of student nurses in the post test was ( $M=17.30$ ;  $SD=3.239$ ) have shown statistically significant improvement when compared to pre test score of ( $M=12.40$ ;  $SD=2.848$ ) with 't' value of 8.280 ( $p<0.05$ ). Hence the null hypothesis  $H_0$  was rejected.



**Table 3**

**Dimensional analysis of knowledge score of student nurses on various aspects of medication management**

**(N=30)**

S.no	Knowledge	Pre test		Post test		‘t’ value
		Mean	S.D	Mean	S.D	
1.	Selection, Procurement and Storage	2.73	.980	3.90	.759	-6.484
2.	Ordering and Transcribing	1.77	1.194	3.90	.84	-8.301
3.	Preparation and Dispensing	1.97	.964	3.73	1.048	-8.102
4.	Administering	2.33	1.061	3.17	.791	-3.618**
5.	Monitoring and Evaluation	2.20	.925	3.33	1.398	-3.798**

\*\*p>0.01

It could be inferred from the table 3 that there was a significant improvement in the selected variables. But the highest improvement mean value observed in the aspects of medication administration (Pre-test 2.33, Post-test 3.17) with ‘t’ value of -3.618 and in monitoring and evaluation the mean value was observed to be Pre test 2.20 post test 3.33 with the ‘t’ value of -3.798. (p>0.01). This showed that there was a significant improvement in the knowledge of this variable after the capacity building program on medication management.

**Table 4**

**Correlation between knowledge and Attitude of student nurses on medication management in pre test and post test**

**(N=30)**

	Pre test		Post test	
	Knowledge	Attitude	Knowledge	Attitude
<b>Mean</b>	10.87	33.30	17.80	38.33
<b>S.D</b>	2.945	6.849	3.718	4.604
<b>‘r’ value</b>	.011		.050	

The above table depicts that there was a positive correlation between the knowledge and attitude and pretest knowledge of student nurses with ‘r’ value of .011, and there was a positive correlation between pretest and post test knowledge and attitude of the student nurses with the ‘r’ value of .050. Hence the null Hypothesis Ho2 was rejected.

**Table 5**

**Correlation between knowledge and practice of student nurses on medication management in pre test and post test**

**(N=30)**

	Pre test		Post test	
	Knowledge	Practice	Knowledge	Practice
<b>Mean</b>	10.87	12.40	17.80	17.30
<b>S.D</b>	2.945	2.848	3.718	3.239
<b>‘r’ value</b>	.245		.346	

The data presented from the table depicts that there was a positive correlation between knowledge and practice of student nurses with the ‘r’ value of .245, and that there was a positive correlation between knowledge and practice with the ‘r’ value of .346. Hence the null Hypothesis Ho2 was rejected.

**Table 6**

**Correlation between attitude and practice of student nurses on medication management in pre test and post test**

**(N=30)**

	Pre test		Post test	
	Attitude	Practice	Attitude	Practice
<b>Mean</b>	33.30	12.40	38.33	17.30
<b>S.D</b>	6.849	2.848	4.604	3.239
<b>‘r’ value</b>	-.289		-.474**	

It could be inferred from the table 6 that there was a significant correlation between attitude and practice with the r value of .289 in the pre test there was statistically significant correlation between attitude and practice with the r value of -.474\*\* ( $p > 0.01$ ). Hence the null Hypothesis Ho2 was rejected.

**Table 7**

**Association between selected demographic variables and level of knowledge of student nurses after capacity building program on medication management during pre test**

(N=30)

Demographic Variables	Level of knowledge				$\chi^2$
	Inadequate Knowledge		Moderately Adequate		
	n	p	n	p	
Age in years					
18-19	4	13.3	1	3.3	.373
19-20	18	60.0	6	20.0	df=2
>20	1	3.3	-	-	NS
Religion					
Hindu	7	23.3	3	10.0	.608
Muslim	1	3.3	-	-	df=2
Christian	15	50.0	4	13.3	NS
Others	-	-	-	-	
Area of Posting					
Medical ward	14	46.7	2	6.7	2.283
Surgical ward	4	13.3	2	6.7	df=2
Others	5	16.7	3	10.0	NS

The above table depicts that there was no significant association between the selected demographic variables and the knowledge of student nurses in the pre test. So the Ho3 null hypothesis was accepted.

**Table 8**

**Association between selected demographic variables and level of knowledge of student nurses after capacity building program on medication management during post test**

(N=30)

Demographic Variables	Level of knowledge						$\chi^2$
	Inadequate		Moderately Adequate		Adequate		
	n	p	n	p	n	p	
Age in years							
18-19	1	3.3	3	10.0	1	3.3	4.747
19-20	3	10.0	5	16.7	16	53.3	df=4
>20	-	-	-	-	1	3.3	NS
Religion							
Hindu	2	6.7	4	13.3	4	13.3	2.895
Muslim	-	-	-	-	1	3.3	df=4
Christian	2	6.7	4	13.3	13	43.3	NS
Others	-	-	-	-	-	-	
Area of Posting							
Medical ward	2	6.7	5	16.7	9	30.3	2.856
Surgical ward	1	3.3	-	-	5	16.7	df=4
Others	1	3.3	3	10.0	4	13.3	NS

The data presented in the table 8 depicts that there was no significant association between the selected demographic variables and the knowledge of student nurses in the post test. So the null hypothesis Ho3 was accepted.

**Table 9**

**Association between selected demographic variables and level of attitude of student nurses after capacity building program on medication management in pre test**

**(N=30)**

<b>Demographic Variables</b>	<b>Low Positive</b>		<b>Level of Attitude</b>		<b>Moderately Positive</b>		<b>Positive</b>	$\chi^2$
	<b>n</b>	<b>p</b>	<b>n</b>	<b>p</b>	<b>n</b>	<b>p</b>	<b>n</b>	
<b>Age in years</b>								
18-19	2	6.7	3	10.0	-	-	-	7.453
19-20	3	10.0	13	43.3	8	26.7	-	df=4
>20	1	3.3	-	-	-	-	-	NS
<b>Religion</b>								
Hindu	4	13.3	6	20.0	-	-	-	9.092
Muslim	-	-	-	-	1	3.3	-	df=4
Christian	2	6.7	10	33.3	7	23.3	-	NS
Others	-	-	-	-	-	-	-	
<b>Area of Posting</b>								
Medical ward	4	13.3	9	30.0	3	10.0	-	3.164
Surgical ward	-	-	3	10.0	3	10.0	-	df=4
Others	2	6.7	4	13.3	2	6.7	-	NS

The data from the table 9 revealed that there was no significant association between the selected demographic variables and the attitude of student nurses in the pre test. So the null hypothesis Ho3 was accepted.

**Table 10**

**Association between selected demographic variables and level of attitude of student nurses after capacity building program on medication management**

**(N=30)**

Demographic Variables	Level of knowledge				$\chi^2$
	Moderately Positive		Positive		
	n	p	n	p	
Age in years					
18-19	3	10.0	2	6.7	1.563
19-20	9	30.0	15	80.0	df=2
>20	-	-	1	3.3	NS
Religion					
Hindu	7	23.3	3	10.0	5.899
Muslim	-	-	1	3.3	df=2
Christian	5	16.7	14	63.3	NS
Others	-	-	-	-	
Area of Posting					
Medical ward	9	30.0	7	23.3	5.781
Surgical ward	-	-	6	20.0	df=2
Others	3	10.0	5	16.7	NS

It could be inferred from the table 10 that there was no significant association between the selected demographic variables and the attitude of student nurses in the post test. So the null hypothesis Ho3 was accepted.



**Table 11**

**Association between selected demographic variables and level of practice of student nurses after capacity building program on medication management in pre test**

(N=30)

Demographic Variables	Level of Practice				$\chi^2$
	Inadequate Practice		Moderately Adequate Practice		
	n	p	n	p	
Age in years					
18-19	1	3.3	4	13.3	1.453
19-20	10	33.3	14	46.7	df=2
>20	-	-	1	3.3	NS
Religion					
Hindu	5	16.7	5	16.7	1.556
Muslim	-	-	1	3.3	df=2
Christian	6	20.0	13	43.3	NS
Others	-	-	-	-	
Area of Posting					
Medical ward	8	26.7	8	26.7	3.266
Surgical ward	2	6.7	4	13.3	df=2
Others	1	3.3	7	23.3	NS

It could be inferred from the table 11 that there was no significant association between the selected demographic variables and the practice of student nurses in the pre test. So the null hypothesis Ho3 was accepted.

**Table 12**

**Association between selected demographic variables and level of Practice of student nurses after capacity building program on medication management in Post test**

(N=30)

Demographic		Level of Practice					
Variables	Inadequate Practice		Moderately adequate Practice		Adequate Practice		$\chi^2$
	n	p	n	p	n	p	
Age in years							
18-19	1	3.3	1	3.3	3	10.0	1.759
19-20	2	6.7	9	30.0	13	43.3	df=4
>20	-	-	-	-	1	3.3	NS
Religion							
Hindu	1	3.3	3	10.0	6	20.0	2.081
Muslim	-	-	1	3.3	-	-	df=4
Christian	2	6.7	6	20.0	11	36.7	NS
Others	-	-	-	-	-	-	
Area of Posting							
Medical ward	2	6.7	5	16.7	9	30.0	7.266
Surgical ward	1	3.3	4	13.3	1	3.3	df=4
Others	-	-	1	3.3	7	23.3	NS

The above table 12 reveals that there was no significant association between the selected demographic variables and the practice of student nurses in the post test. So the null hypothesis Ho3 was accepted.

## **Summary**

This chapter dealt with the analysis and interpretation of data obtained by the researcher. The analysis of the results showed that there was a significant improvement in the knowledge, attitude and practice after the capacity building program.

## **CHAPTER – V**

### **DISCUSSION**

A Pre experimental study to assess the effectiveness of capacity building on medication management among student nurses at Apollo college of Nursing Chennai.

#### **The objectives of the study were**

1. To assess the existing level of knowledge, attitude and practice regarding medication management among student nurses.
2. To compare the effectiveness of capacity building on medication management among student nurses
3. To inter-correlate the knowledge, attitude and practice regarding medication management among student nurses before and after implementation of capacity building program
4. To determine the association between selected demographic variables and knowledge, attitude and practice of student nurses before and after implementation of capacity building program.

#### **The discussion is presented as follows**

Nursing profession has been identified to be essential for the promotion of Patient safety. Nurses play a vital role in identifying and preventing the medication errors. So this study was conducted among the student nurses to determine the knowledge attitude and practice regarding medication management. Majority of the student nurses (80%) belonged to the age group of 19-20 years. Most of the student nurses (16.7%) were in the age group of 18-19 years. Most of the student nurses

(63.3%) were Christians. Only 10% of them were Hindu and 3.3% were Muslims. The student nurses gain wide range of experience during their clinical postings. The student nurses are posted in all the wards. Most of them were in medical ward (53.3%) about 6% of the student nurses were posted in surgical ward. Only 8% of the student nurses were posted in other wards. All the student nurses who participated in the study were posted in day shift and had previous knowledge on medication management.

**The first objective of the study is to assess the existing level of knowledge, attitude and practice regarding medication management among student nurses.**

The institute of Medicine (1999) report states that medication errors account for 44,000 – 98,000 deaths each year and it is the eighth leading cause of death in the United States. So the study recommended to improve and empower nurse's knowledge on preventing medication errors. The present study reveals that a majority of the student nurses (76.7%) in the pre test had inadequate knowledge and 23.3 % of the nurses had moderately adequate knowledge and none of the student nurses had adequate knowledge on medication management. The attitude was assessed using a rating scale. The study results revealed that most of the student nurses 53.3% had moderate attitude and 6% of the student nurses had low attitude and only 8% of the student nurses had high attitude.

The pretest score on the practice revealed that most of the student nurses had moderately adequate practice (63.3%) and 11% of the student nurses had inadequate practice. This result depicts that it is necessary to improve the knowledge, attitude and practice of student nurses.

Wolf in the year 2009 identified the characteristics of medication errors made by students during the administration phase 3% of 1,305 student-made medication errors occurring in the administration process resulted in patient harm. Most were omission errors, followed by errors of giving the wrong dose of a drug. The most prevalent cause of the errors was students' performance deficits, whereas inexperience and distractions were leading contributing factors.

**The second objective of the study is to compare the effectiveness of capacity building program on medication management among student nurses.**

The study results reveal that the post test level of knowledge among nurses shows a significant improvement in the level of knowledge most (60%) of the student nursing student had adequate knowledge and 26.7% of the student nurses had moderately adequate knowledge. Comparison of pre test and post test knowledge have shows a significant improvement among the student nurses. The mean knowledge score of student nurses in the pre test was ( $M=10.87$ ;  $SD=2.945$ ) and in the post test ( $M=17.80$ ;  $SD=3.718$ ) which is statistically significant with the 't' value of 9.297 ( $p<0.05$ ). Hence the null hypothesis  $H_01$  was rejected

These findings are supported by Lim and Chiu (2010) who did a study to assess the Nurse's knowledge on medication management and adverse drug reactions in an elderly in aged care facility. They evaluated an education program to increase pharmacology knowledge and prevent adverse drug reactions in the elderly, and develop. The results showed that in the Pre-test knowledge deficits in medication

management and adverse drug reactions in the elderly was noted but the post-test showed statistically significant improvement in nurses knowledge.

The present study shows that the pretest attitude of the student nurses revealed that only (26.7%) had positive attitude on medication management but in the post test most of the students had positive attitude (60%) on medication management. The mean attitude score of student nurses in the post test was  $M=38.33$ ;  $SD=4.604$  when compared to pre test value of  $M= 33.30$ ;  $SD=6.849$  with 't' value of 5.810 ( $p<0.05$ ).which is statistically significant. Hence the null hypothesis  $H_0$  was rejected.

The practice scores reveal that (36.7%) had inadequate practice but in the post test most of them had adequate practice (56.7%) and only 10% had inadequate practice. The mean practice score of student nurses in the post test was ( $M=17.30$ ;  $SD=3.239$ ) but showed statistically significant improvement when compared to pre test score of  $M=12.40$ ;  $SD=2.848$  with 't' value of 8.280. ( $p<0.05$ ). Hence the null hypothesis was rejected.

### **Dimensional analysis of the knowledge scores**

The study results revealed that there was a significant improvement in the selected variables. But the highest improvement mean value was observed in the aspects of medication administration (Pre-test 2.33, Post-test 3.17 with 't' value of 3.618. And in monitoring and evaluation the mean value was observed to be (Pre test 2.20) post test 3.33 with the 't' value of 3.798. ( $p>0.01$ ). This showed that there is a significant improvement in the knowledge variable after the capacity building program on medication management.

**The third objective is to inter-correlate the knowledge, attitude and practice regarding medication management among student nurses before and after implementation of capacity building program.**

The study concluded that there is a positive correlation between the knowledge and attitude with the pretest and the post test 'r' value of .011 and .050 respectively. There was a positive correlation between knowledge and practice of student nurses in the pre test and post test with the 'r' value of .245 and .346 respectively. Significant correlation occurred between the attitude and practice of student nurses with 'r' value of .289. And statistically significant correlation occurred between attitude and practice in the post test among student nurses with 'r' value of -.474 ( $p > 0.01$ ). Hence the null hypothesis Ho2 was rejected.

This study is consistent with the study results of King (2000), who explored nurses' pharmacology education needs by identifying nursing roles that require pharmacology knowledge, and nurses' preparation for practice from preregistration pharmacology education. A limited understanding of the subject, dissatisfaction with the teaching of pharmacology, resulting anxiety on qualifying. Nursing roles identified as requiring pharmacology knowledge included drug administration, patient assessment, nurse prescribing, and patient medication education. The findings suggest that, although nurses have a limited understanding of pharmacology, they recognize the need for pharmacology knowledge in practice.



**The fourth objective is to determine the association between selected demographic variables and knowledge, attitude and practice of student nurses before and after implementation of capacity building program.**

The present study shows that there is no significant association between selected demographic variables and knowledge, attitude and practice of student nurses. Hence the null hypothesis Ho3 was accepted.

### **Summary**

This chapter dealt with the objectives of the study, major findings of the demographic variables, existing level of knowledge, attitude and practice, comparison of pre test and post test knowledge, attitude and practice in relation to various aspects of medication management mean, standard deviation, inter-correlation between knowledge , attitude and practice before and after implementation of capacity building program and association between selected demographic variable and the level of knowledge, attitude and practice on in pre test and post test.

**CHAPTER – VI**  
**SUMMARY, CONCLUSION, NURSING IMPLICATION**  
**AND RECOMMENDATIONS**

**Summary**

This chapter deals with the summary of the study findings Conclusion, Implications and Recommendations.

**Statement of the problem**

A Pre experimental study to assess the effectiveness of capacity building on medication management among student nurses at Apollo College of Nursing, Chennai

**The objectives of the study were**

1. To assess the existing level of knowledge, attitude and practice regarding medication management among student nurses.
2. To compare the effectiveness of capacity building on medication management among student nurses
3. To inter-correlate the knowledge, attitude and practice regarding medication management among student nurses before and after implementation of capacity building program.
4. To determine the association between selected demographic variables and knowledge, attitude and practice of student nurses before and after implementation of capacity building program.

### **Null Hypothesis**

- Ho1:** There will be no significant relationship between pre and post test knowledge, attitude and practice scores of student nurses on medication management
- Ho2 :** There will be no significant correlation between knowledge, attitude and practice of student nurses on medication management
- Ho3 :** There will be no significant association between selected demographic variables and knowledge, attitude and practice of student nurses on medication management

An extensive review of literature and guidance by experts laid the foundation to the development of structured questionnaire, rating scale on level of attitude and checklist to assess the practice. The conceptual framework was based on J.W.Kenny's Open system model.

A pre experimental research approach with a pre experimental type of one group pre and post test design was used to achieve the objective of the study. The present study was conducted among the student nurses of Apollo College of nursing Chennai, by using non probability convenient sampling technique.

The instruments used for data collection were demographic variables Proforma, structured questionnaire to assess the knowledge, rating scale to assess the level of attitude and checklist to assess the practice on capacity building on medication management. The data collection tools were validated and the reliability was determined by pilot study following which data was collected for main study. After pre test capacity building program was implemented on the student nurses.

The post test was conducted one week after the pre test. The collected data was tabulated and analyzed using descriptive and inferential statistics, Frequency and percentage were computed to summarize the sample characteristics .Mean and Standard deviation were used to compare the pre test and post test level of knowledge ,attitude and practice on medication management.

Chi square test was applied to find out the association between the knowledge, attitude and practice of student nurses with selected demographic characteristics and 't' test distribution for analyzing the various aspects of medication management. Pearson correlation was used to determine the correlation between knowledge, attitude and practice on medication management among student nurses.

### **Major findings of the study**

#### **Frequency and Percentage distribution of demographic variables of student nurses**

Majority of the student nurses (80%) belonged to the age group of 19-20 years. Most of the student nurses (63.3 %) were Christians, most of them were posted in medical wards (53.3%). All the student nurses who participated in the study were posted in day shift and had previous knowledge on medication management.

#### **Frequency and percentage distribution of level of knowledge, attitude and practice in pre test and post test on medication management.**

The study reveals that a majority of the student nurses (76.7%) in the pre test had inadequate knowledge and 23.3 % of the student nurses had moderately adequate

knowledge. and none of the student nurses had adequate knowledge on medication management. But in the post test there was a significant improvement in the level of knowledge most of the student nurses (60%) had adequate knowledge and significant number of student nurses (26.7%) had moderately adequate knowledge and only (13.30%) of them had inadequate knowledge.

The present study shows that the pretest attitude of the student nurses revealed that only (26.7%) had positive attitude on medication management but in the post test most 60% of the students had positive attitude regarding medication management. and (36.7%) had inadequate practice but in the post test most of the student nurses (56.7%) had adequate practice, significant (33.30%) exhibited moderately adequate practice and only 10% had inadequate practice.

#### **Comparison of pre test and post test knowledge, attitude and practice scores of student nurses in relation to various aspects of medication management.**

The comparison of pre test and post test level of knowledge revealed that the mean knowledge score of student nurses in the pre test was ( $M=10.87$ ;  $SD=2.945$ ) and in the post test ( $M= 17.80$ ;  $SD=3.718$ ) which is statistically significant with the 't' value of 9.297 ( $p>0.05$ ). Hence the null hypothesis  $H_{01}$  was rejected. The mean attitude score of student nurses in the post test was  $M=38.33$ ;  $SD=4.604$  when compared to pre test value of  $M= 33.30$ ;  $SD=6.849$  with 't' value of 5.810 ( $p>0.05$ ), which was statistically significant. Hence the null hypothesis  $H_{01}$  was rejected.

The mean practice score of student nurses in the post test was  $M=17.30$ ;  $SD=3.239$ ) but showed statistically significant improvement when compared to pre test

score of  $M=12.40$ ;  $SD=2.848$  with 't' value of 8.280 ( $p<0.05$ ). Hence the null hypothesis was rejected.

**Correlation of knowledge, attitude and practice regarding medication management among student nurses before and after implementation of capacity building program.**

The correlation between the knowledge, attitude and practice was assessed in the pre test and post test among student nurses. The study concluded that there is a positive correlation between the knowledge and attitude with the pretest and the post test 'r' value of .011 and .050 respectively. There was a positive correlation between knowledge and practice of student nurses in the pre test and post test with the 'r' value of .245 and .346 respectively. Significant correlation occurred between the attitude and practice of student nurses with 'r' value of -.289 and statistically significant correlation occurred between attitude and practice in the post test among student nurses with 'r' value of -.474 ( $p<0.01$ ). Hence the null hypothesis  $H_{o2}$  was rejected.

**Association between selected demographic variables and knowledge, attitude and practice of student nurses before and after implementation of capacity building program.**

The present study shows that there is no significant association between selected demographic variables and the knowledge, attitude and practice of student nurses. Hence the null hypothesis  $H_{o3}$  is accepted.

## **Conclusion**

The study revealed that the capacity building on medication management among student nurses was effective in bringing out positive changes in the knowledge, attitude and practice who took part in the program. In the future they are able to prevent medication errors and reduce adverse drug reaction among Patients.

## **Implications**

The findings of the study has implications in different branches of nursing profession i.e Nursing practice, Nursing education, Nursing administration and Nursing research. By assessing the knowledge of student nurses regarding medication management we get a clear picture regarding different steps to be taken in all these fields to improve the knowledge of student nurses.

### **Nursing Practice**

Nurses should develop skill in identifying the need for health education and its proper implementation. Adequate training and supervision should be provided to the nurses working in the Hospital. Organizing a in-service education on medication management by nursing educators in Hospitals and in community level should be provided to Public health nurses. This must be addressed mainly for the fresher's who come from different places to promote knowledge and prevent medication errors. These measures can improve the quality of care in the hospital.

Nursing educator in different wards can do incidental teaching on medication management. To make nurses aware of it Nursing educators and Nursing supervisors

can train Paramedical, Voluntary workers, nursing staffs in the school and community health workers to work on medication management and prevent medication errors.

### **Nursing Education**

This study emphasizes the need for developing good teaching and learning skills among the nursing students and also necessary in service education should be provided to the nursing personnel at various levels. The curriculum of nursing students should emphasize on the medication management and its various aspects like medication errors and medication administration. By conducting the teaching programs for the nurse the outcome and the quality of care provided by the nurse can be drastically improved.

### **Nursing Administration**

This study emphasizes the nursing administrator should take an effective steps in maintaining medication safety and conducting audits frequently on medication errors. The nurse administrator should conduct workshops on medication management. The administrator should instruct the JCAI standards its application in practice and quality improvement.

### **Nursing Research**

This study emphasizes on research studies to be undertaken on medication management to improve the knowledge of student nurses and also to conduct analytical study to assess the medication errors by conducting capacity building programs on medication management.



## **Recommendations**

- An experimental study can be conducted for a large group of student nurses
- An observational study can be conducted to assess the practice of student nurses on medication management and assess the statistics and type of medication errors that occurs commonly.
- An experimental study can be done by conducting a training program on medication management
- The same study can be conducted for the community health nurses and school health nursing personnel.
- A retrospective study can be conducted whether the JCIA standards were applied in practice.

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[www.jcrinc.com](http://www.jcrinc.com) › [Books](#)

[www.wrongdiagnosis.com/m/medication\\_errors/stats.htm](http://www.wrongdiagnosis.com/m/medication_errors/stats.htm)

## APPENDIX – A

### LETTER SEEKING PERMISSION TO CONDUCT THE STUDY



**Apollo College of Nursing**

*(Recognised by the Indian Nursing Council and Affiliated to the Tamil Nadu Dr. M.G.R. Medical University, Chennai)*

CO/017/11

16.12.2010

To

Ms.E.Pauline  
M.Sc (N) II year  
Apollo College of Nursing  
Chennai – 95

**Sub.:** To grant permission for research study – Reg.

**Greetings!** With reference to your letter, you are permitted to conduct a study on **“A pre experimental study to assess the effectiveness of capacity building on medication management among student nurses at Apollo College of Nursing, Chennai.”**

Thanking You,

**Dr. LATHA VENKATESAN**  
**PRINCIPAL**

IS/ISO 9001:2000



Vanagaram to Ambattur Main Road, Ayanambakkam, Chennai - 600 095.  
Ph. : 044 - 2653 4387 Tele fax : 044 - 2653 4923 / 044- 2653 4386

## APPENDIX –B

### LETTER PERMITTING TO CONDUCT THE STUDY

6-12-2010

From

E.Pauline  
M.Sc,(N) II Year  
Apollo College of Nursing  
Chennai-95

To

The Principal  
Apollo College of Nursing  
Ayanambakkam  
Chennai-95

*Accepted*  
11/1/11

Respected Madam,

Sub: Seeking Permission for conducting research-Reg.

As a part of the curriculum requirement of II Year M.Sc Nursing, I have selected the following title for my research study.

**“A Pre experimental study to assess the effectiveness of capacity building on medication management among student nurses at Apollo College of Nursing – Chennai.”**

So, I kindly request you to grant me permission to conduct the study in our esteemed institution

Thanking You,

Yours' obediently

**E.Pauline.**

## APPENDIX – C

### ETHICS COMMITTEE LETTER

#### Ethics Committee



14 July, 2010

To,  
Ms. E. Pauline  
Final Year M.Sc (Nursing)  
Apollo College of Nursing, Chennai  
Tamil Nadu, India

**Ref:** A pre experimental study to assess the effectiveness of capacity building on medication management among student nurses at Apollo College of Nursing, Chennai.

**Sub:** Your letter dated 06 July 2010 for approval of the above referenced project and its related documents

Dear Ms. E. Pauline,

Ethics committee – Apollo Hospitals has received the following document submitted by you related to the conduct of the above – referenced study.

- Project Proposal titled “A pre experimental study to assess the effectiveness of capacity building on medication management among student nurses at Apollo College of Nursing, Chennai.”
- Study Proforma

Ethics Committee Apollo Hospitals reviewed and discussed the above-mentioned documents presented by you related to the conduct of above-referenced study at its meeting held on 13 July, 2010.

The following Ethics Committee members were present at the meeting held on 13 July, 2010

Name	Profession	Position in the committee
Mr. S. S. Narayanan	Ethicist	Chairman
Dr. Radha Rajagopalan	Clinician	Vice – Chairman
Ms. Jayanthi Swaminathan	Clinical Project Manager	Member Secretary
Dr. V. Balaji	Clinician	EC-Member
Dr. C. Paul Dilip Kumar	Clinician	EC-Member
Dr. K. C. Krishnakumar	Clinician	EC-Member

## Ethics Committee



Name	Profession	Position in the committee
Dr. Clive Fernandes	Consultant Clinical Pharmacologist	Basic Medical Scientist
Ms. Maimoona Badsha	Lawyer	Lawyer
Mrs. Chandra Jebaseelan	Nursing Superintendent	EC-Member
Dr. P. Nalini Rao	Social Worker	EC-Member
Miss. N. Suseela	Retired English Teacher	Layperson

After due ethical and scientific consideration, the Ethics Committee has approved the above presentation submitted by you.

The Ethics Committee is constituted and works as per ICH-GCP, ICMR and revised Schedule Y guidelines.

Yours sincerely,

Dr. Radha Rajagopalan  
Ethics Committee – Vice Chairman  
Apollo Hospitals, Chennai

Date 14/7/10

DR. RADHA RAJAGOPALAN  
Vice Chairman  
Ethics Committee  
Apollo Hospitals Enterprise Limited  
Chennai-600 006, Tamil Nadu.



## APPENDIX – D

### ANTI-PLAGIARISM ORIGINALITY REPORT



#### Plagiarism Detector - Originality Report

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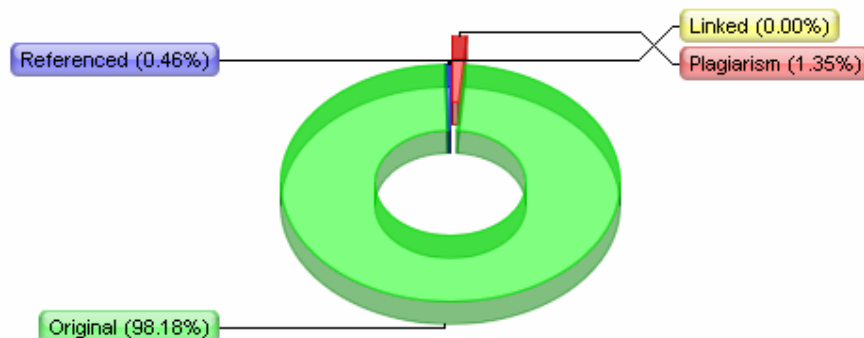
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## APPENDIX – E

### LETTER SEEKING PERMISSION FOR CONTENT VALIDITY

From,  
E.Pauline,  
MSc( Nursing) II Year,  
Apollo college of Nursing,  
Chennai- 95

To,

Through the proper channel  
Dr. Latha Venkatesan,  
Principal  
Apollo College of Nursing,  
Chennai -95

*Latha*  
*20/5/10.*

**Sub: Request for opinion and suggestion of experts for establishing content validity of Research tool.**

Respected Sir / Madam,

Greetings! As a part of the curriculum requirement the following research title is selected for the study.

**Title:**

**A Pre experimental study to assess the video assisted programme on capacity building in medication management among Pediatric nurses at a selected Hospital – Chennai.**

I will be highly privileged to have your valuable suggestions with regard to the establishment of content validity of Research tool and give suggestion about the tool .

Thanking You

Yours sincerely,

( E.PAULINE )

Place :

Date :

**APPENDIX – F**  
**CONTENT VALIDITY CERTIFICATE**

I hereby certify that I have validated the Research tool of Ms.E.PAULINE, II Year M.Sc., (N)., student who is undertaking the Research study. A Pre experimental study to assess the effectiveness of capacity building on medication management among student nurses at Apollo College of Nursing – Chennai.

**Signature of the expert**

**Name and designation**

## **APPENDIX - G**

### **LIST OF EXPERTS**

**1. Dr.Latha Venkatesan, M.Sc (N)., MPhil., Ph.D.,**

Principal,

Apollo College of Nursing,

Chennai - 600 095.

**2. Prof.Lizy Sonia M.Sc.,(N).,Ph.D.,**

Vice Principal,

Apollo College of Nursing,

Chennai - 600 095.

**3. Dr.Mathra Bootham Sridhar MRCP ch (UK)**

Consultant Pediatrics,

Apollo Children's Hospital's,

Chennai – 600 006.

**4. Mrs.Nesa Sathya Satchi M.Sc (N).,**

Reader Pediatrics,

Apollo College of Nursing,

Chennai – 600 095.

**5. Prof.Vijaya Lakshmi M.Sc (N).,Ph.D.,**

HOD of Psychiatry Department,

Apollo College of Nursing,

Chennai – 600 095.

**6. Prof.Anitha Rajendrababu M.Sc (N),Ph.D.,**

Principal,

Rajalakshmi College of Nursing,

Chennai - 600 095.

**7. Mrs.Kala M.Sc (N),**

Assistant Professor,

Apollo College of Nursing,

Chennai – 600 095.

**8. Mrs.Sophia Emelda M.Sc (N),**

Assistant Professor,

Meenakshi College of Nursing,

Chennai - 600 095.

**APPENDIX –H**  
**RESEARCH PARTICIPANTS CONSENT FORM**

Dear Participants,

I am M.Sc. Nursing student at Apollo College of Nursing, Chennai, As part of my studies, A research on ‘Effectiveness of capacity building on medication management among the student nurses at Apollo College of Nursing Chennai.’ is selected to be conducted. The findings of the study will be helpful in teaching the nurses.

I hereby seek your consent and cooperation to participate in the study .Please be frank and honest in your responses .The information collected will be kept confidential and anonymity will be maintained

Signature of the Researcher,

I ----- hereby consent to participate and undergo the study

Signature of the Participant,

## APPENDIX – I

### CERTIFICATE FOR ENGLISH EDITING

To whomsoever it may concern

This is to certify that the dissertation titled, Effectiveness of capacity building on medication management among student nurses at Apollo College of Nursing - Chennai, by E- PAULINE II year, M.Sc., Nursing Student of Apollo College of Nursing, was edited for English Language appropriateness by Mr. / Ms C. JENIFER PUSHPALATHA M.A M.Ed MPhil.

  
Signature  
C.S.I. Ida Scudder Nursery & Primary School  
CMC Colony, Sathuvachari,  
VELLORE - 632 009.

## **APPENDIX – J<sub>1</sub>**

### **DEMOGRAPHIC VARIABLE PROFORMA**

#### **Purpose**

This Performa is used to measure the demographic variables such as age, religion, area of posting, work shift and Previous knowledge

#### **Instruction**

Read the following items carefully and select one correct response and place tick mark in the respective box.

#### **Sample number**

##### **1. Age in years**

1.1 18-19 years

☐

1.2 19-20 years

☐

1.3 >20 years

☐

##### **2. Religion**

2.1 Hindu

☐

2.2 Muslim

☐

2.3 Christian

☐

2.4 Others

☐

##### **3. Area of Posting**

3.1 Medical ward

☐

3.2 Surgical ward

☐

3.3 Others

☐



**4. Work shift**

4.1 Day shift

☐

4.2 Night shift

☐

**5. Have you attended any previous class attended on medication management?**

5.1 Yes

☐

5.2 No

☐

### BLUE PRINT

S.NO	CONTENT	ITEMS	TOTAL ITEMS	PERCENTAGE
1.	Selection, Procurement and Storage	1,2,3,4,5,	5	20
2.	Ordering , Transcribing	6,7,8,9,10	5	20
3.	Preparation and Dispensing	11,12,13,14,15	5	20
4.	Administering	16,17,18,19,20	5	20
5.	Monitoring and Evaluation	21,22,23,24,25	5	20

## **APPENDIX – J<sub>2</sub>**

### **STRUCTURED QUESTIONNAIRE TO ASSESS THE KNOWLEDGE REGARDING MEDICATION MANAGEMENT**

#### **Purpose**

The structured questionnaire is used to assess the knowledge regarding medication management

#### **Instruction**

- Please read the questions carefully.
- Choose the correct answer and place a tick (✓) mark in the following.
- The information collected will be used for research purpose only.

#### **SELECTION, PROCUREMENT AND STORAGE**

##### **1. The medication management system members of the medical staff are Physician, Nurse and**

1.1 Pathologist

☐

1.2 Microbiologist

☐

1.3 Physician assistant

☐

1.4 Pharmacist

☐

##### **2. The criteria for selection and Procurement of drugs includes the following**

##### **EXCEPT**

2.2 Indication

☐

2.2 Risks

☐

2.3 Errors

☐

2.4 Abuse

☐

**3. The national patient goals for 2003 and 2004 states to**

3.1 Secure cabinets

☐

3.2 Label narcotics

☐

3.3 Standardize drug concentrations

☐

3.4 Prevent decontamination

☐

**4. Which medications need to be stored in unit dose, age specific, and ready to administer form**

4.1 Chemotherapeutic drugs

☐

4.2 Psychopharmacological drugs

☐

4.3 Emergency medication

☐

4.4 Electrolytes

☐

**5. The following drugs which need to be segregated are the following EXCEPT**

5.1 Damaged drugs

☐

5.2 Contaminated drugs

☐

5.3 Expired drugs

☐

5.4 Stable drugs

☐

**ORDERING AND TRANSCRIBING**

**6. The computer prescriber order entry system is designed to prevent**

6.1 Dispensed error

☐

6.2 Transcription error

☐

6.3 Prescribing error

☐

6.4 Subscription error

☐

**7. Medication error commonly occurs among**

7.1 Look alike medications

☐

7.2 Drugs in unit doses

☐

7.2 Intravenous drugs

☐

7.4 Psychotropic agents

☐

**8. Orders in which the dose is decreased in a particular amount with each dosing interval is termed as**

8.1 Titrating order

☐

8.2 Taper order

☐

8.3 Range order

☐

8.4 Resume order

☐

**9. Each component of a TPN formula is calculated in**

9.1 Per kg

☐

9.2 Per kg pre day

☐

9.3 Per ml and per day

☐

9.4 Per hour

☐

**10. The verbal order for a medication must be given only to the following EXCEPT**

10.1 A licensed nurse

☐

10.2 Pharmacist

☐

10.3 Auxiliary nurse midwife

☐

10.4 Another physician

☐

## **PREPARING AND DISPENSING**

### **11. Which medical staff should review each medication order prior to dispensing and removal of stock in emergency**

- 11.1 Physician ☐
- 11.2 Pharmacist ☐
- 11.3 Surgeon ☐
- 11.4 Nurse ☐

### **12. Intravenous admixture are prepared before administering in**

- 12.1 Appropriate temperature ☐
- 12.2 Laboratory ☐
- 12.3 Sterile environment ☐
- 12.4 Nurse's room ☐

### **13. The medication label should contain the information like drug name, strength, diluents and**

- 13.1 Frequency ☐
- 13.2 Amount ☐
- 13.3 Precaution ☐
- 13.4 Signature ☐

### **14. To dispense safe medication the nurse should include appropriate time, appropriate form and**

- 14.1 Adequate concentration ☐
- 14.2 Appropriate trade name ☐
- 14.3 Adequate quantity ☐
- 14.4 Stability ☐

**15. Quality control procedures help to prevent**

15.1 Retrieval errors

☐

15.2 Transcription error

☐

15.3 Dispensing error

☐

15.4 Prescription error

☐

**ADMINISTERING**

**16. The term double checking implies on**

16.1 Checking medication order

☐

16.2 Checking medication against medication order

☐

16.3 Checking medication order with nurse

☐

16.4 Checking medication order with physician

☐

**17. The nurse should check for**

17.1 Correct patient, drug name

☐

17.2 Date, integrity, frequency

☐

17.3 Time, dose, Route

☐

17.4 All of the above

☐

**18. One of the most common medication error identified is**

18.1 Wrong patient, delayed administration

☐

18.2 Wrong equipment, adverse effects

☐

18.3 Wrong dose, drug interactions

☐

18.4 Wrong dispenser, complications

☐

**19. The institute of medicine indicates**

19.1 Patient rights

☐

19.2 Patient education

☐

19.3 Patient observation

☐

19.4 Patient training

☐

**20. The patient self administration of medication need the following EXCEPT**

20.1 Training

☐

20.2 Supervision

☐

20.3 Counseling

☐

20.4 Documentation

☐

**MONITORING AND EVALUATION**

**21. Which one of the following is a high risk medication EXCEPT**

21.1 Chemotherapeutic drugs

☐

21.2 Investigational drugs

☐

21.3 Psychotherapeutic drugs

☐

21.4 Corticosteroids.

☐

**22. The drugs which have potential errors, sentinel events is termed as**

22.1 High risk medication

☐

22.2 High dose medications

☐

22.3 Poisons

☐

22.4 Emergency medications

☐



**23. Which of the following is an example for lookalike and sound alike medications**

23.1 Tamiflu, Remelgel

☐

23.2 Lodine, Iodine

☐

23.3 Crocin, Acetaminophene

☐

23.4 Vincristine, Vinblastin

☐

**24. The nurse while administering Psychopharmacological drugs should monitor for**

24.1 Normal behavior

☐

24.2 Altered knowledge

☐

24.3 Altered mental status

☐

24.4 Altered food intake

☐

**25. The hospital should evaluate**

25.1 Risk points and identify areas to improve safety

☐

25.2 Evaluate the literature for best practice

☐

25.3 Evaluate internally generated reports to identify trends or issues

☐

25.4 All of the above.

☐

**SCORING KEYS**

≤ 50 %

Inadequate knowledge

51- 75 %

Moderately adequate knowledge

≥ 76 %

Adequate knowledge

## **KEYS FOR KNOWLEDGE QUESTIONNAIRE**

### **SELECTION, PROCUREMENT AND STORAGE**

1. 4
2. 4
3. 3
4. 3
5. 4

### **ORDERING AND TRANSCRIBING**

6. 2
7. 1
8. 2
9. 2
10. 3

### **PREPARING AND DISPENSING**

11. 2
12. 3
13. 2
14. 3
15. 15.1

### **ADMINISTERING**

16. 16.2
17. 17.4
18. 18.1
19. 19.2
20. 20.3

### **MONITORING AND EVALUATION**

21. 21.4
22. 22.1
23. 23.2
24. 24.3
25. 25.4

## APPENDIX – J<sub>3</sub>

### RATING SCALE TO ASSESS THE ATTITUDE REGARDING THE MEDICATION MANAGEMENT

#### Purpose

The purpose of this to assess the attitude regarding medication management among nurses.

#### Instruction

The researcher collects information by administering the rating scale on medication management

Sl. No	Items	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1.	I agree that all the nurses should follow ten rights to prevent medication errors					
2.	I believe that medication errors and adverse drug reactions could be fatal					
3.	I feel hesitant to report the occurrence of medication errors					
4.	I feel that developing the protocol for medication administration will not be easy to follow					
5.	I agree that the Hospital should develop processes for managing high risk or high alert medications					
6.	I feel that all hospital should have an orientation program on medication management					

7.	I agree that auditing will not reduce medication errors					
8.	I feel that in-service education on medication management can improve the capacity in medication administration					
9.	I believe that all hospitals should evaluate its medication management system					
10.	I feel that proper communication between the medication management professionals can bring about quality improvement in the hospital					

### SCORING KEY

$\leq 50 \%$	Low Attitude
51 – 75 %	Moderate Attitude
$\geq 75 \%$	High Attitude

Statement	Positive	Negative
Strongly agree	5	1
Agree	4	2
Undecided	3	3
Disagree	2	4
Strongly agree	1	5

## APPENDIX – J<sub>4</sub>

### PERFORMANCE CHECKLIST TO ASSESS PRACTICE OF MEDICATION MANAGEMENT

#### Purpose

This checklist is to observe the practice of medication administration among nurses.

#### Instruction

The researcher collects data by observation of during medication administration

Sl. NO	ITEMS	YES	NO
<b>1.</b>	<b>PRELIMINARY ACTIONS</b>		
<b>1.1</b>	Identifies the child using any two identifiers like ID, bracelet, chart.		
<b>1.2</b>	Confirms medication against medication order.		
<b>1.3</b>	Check's child's health record for allergies.		
<b>1.4</b>	Educates the parents about side effects		
<b>1.5</b>	Performs hand hygiene		
<b>1.6</b>	Calculates the correct dose		
<b>2</b>	<b>ORAL MEDICATION EQUIPMENT</b>		
<b>2.7</b>	A tray containing Medication		
<b>2.8</b>	Kidney basin		
<b>2.9</b>	Glass with water and lid		
<b>2.10</b>	Medicine container		
<b>2.11</b>	Measuring cup		
<b>2.12</b>	A cloth or tissue to wipe		
<b>2.13</b>	Medication card		

	<p><b>PREPARATION AND ADMINISTRATION</b></p> <p><b>2.14</b> Prepares tablets with pill crushing device/ Pours the desired volume of medicine syrup into a measuring cup</p> <p><b>2.15</b> Enquires about the last meal</p> <p><b>2.16</b> Tablet: Administers drug with water / juice / Syrup: Administers syrup</p> <p><b>2.17</b> Confirms that the medication has been swallowed</p> <p><b>REPLACEMENT AND RECORDING</b></p> <p><b>2.18</b> Disposes the waste</p> <p><b>2.19</b> Replaces the articles</p> <p><b>2.20</b> Performs hand hygiene</p> <p><b>2.21</b> Records medication administered immediately</p> <p><b>2.22</b> Evaluates for therapeutic response</p> <p><b>3. INTRAVENOUS MEDICATION :</b></p> <p><b>EQUIPMENT</b></p> <p><b>3.1</b> A tray containing Medication for dilution</p> <p><b>3.2</b> A sterile syringe with normal saline for flushing</p> <p><b>3.3</b> A sterile syringe of appropriate size</p> <p><b>3.4</b> Sterile swab</p> <p><b>3.5</b> A small sterile tray</p> <p><b>3.6</b> Medication card</p>		
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	<b>PREPARATION AND ADMINISTRATION</b>		
<b>3.7</b>	Loads medication in the sterile syringe without air bubble and keeps in the medication tray		
<b>3.8</b>	Selects the injection port for intravenous injection and cleans the injection port with antiseptic swab		
<b>3.9</b>	Places the adaptor in the small sterile tray upside down		
<b>3.10</b>	Checks for blood return and flushes with saline		
<b>3.11</b>	Injects medication slowly		
<b>3.12</b>	Flushes with normal saline		
<b>3.13</b>	Cleanses the port with sterile swab and recaps		
	<b>REPLACEMENT AND RECORDING</b>		
<b>3.14</b>	Disposes the waste		
<b>3.15</b>	Replaces the articles		
<b>3.16</b>	Perform hand hygiene		
<b>3.17</b>	Records medication administered immediately		
<b>3.18</b>	Evaluates for therapeutic response.		
<b>4.</b>	<b>INTRAMUSCULAR MEDICATION :</b>		
	<b>EQUIPMENT</b>		
<b>4.1</b>	A tray containing Medication for dilution		
<b>4.2</b>	A sterile syringe of appropriate size		
<b>4.3</b>	Sterile swab		
<b>4.4</b>	A small sterile tray		
<b>4.5</b>	Medication card		

	<b>PREPARATION AND ADMINISTRATION</b>		
<b>4.6</b>	Loads the medication in the syringe		
<b>4.7</b>	Provides privacy		
<b>4.8</b>	Assists child to comfortable position according to injection site.		
<b>4.9</b>	Locates site using anatomic landmarks.		
<b>4.10</b>	Cleans injection site with antiseptic swab		
<b>4.11</b>	Grasps muscle		
<b>4.12</b>	Injects needle at 90 degree angle.		
<b>4.13</b>	Aspirates to check for blood return.		
<b>4.14</b>	Administers medication slowly.		
<b>4.15</b>	Withdraws needle quickly while placing antiseptic swab on skin above the injection site		
<b>4.16</b>	Massages the skin		
<b>4.17</b>	Assists client to comfortable position.		
	<b>REPLACEMENT AND RECORDING</b>		
<b>4.18</b>	Discards uncapped needle and syringe in proper receptacle.		
<b>4.19</b>	Replaces the articles		
<b>4.20</b>	Performs hand hygiene		
<b>4.21</b>	Records medication administered immediately		
<b>4.22</b>	Evaluates for therapeutic response.		
<b>5</b>	<b>SUBCUTANEOUS INJECTION : EQUIPMENT</b>		
<b>5.1</b>	A tray containing Medication for dilution		
<b>5.2</b>	A sterile syringe of appropriate size		



5.3	Sterile swab		
5.4	A small sterile tray		
5.5	Medication card		
	<b>PREPARATION AND ADMINISTRATION</b>		
5.6	Provides privacy.		
5.7	Exposes only the site		
5.8	Assists client to comfortable position.		
5.9	Selects appropriate injection site		
5.10	Locates site using anatomic landmarks.		
5.11	Cleans site with antiseptic swab.		
5.12	Pinches skin as indicated.		
5.13	Injects needle quickly at 45-90 degree angle.		
5.14	Grasps lower end of the syringe barrel with non-dominant hand and moves dominant hand to plunger.		
5.15	Withdraws needle quickly while placing swab on skin above injection site.		
5.16	Applies gentle pressure to site does not massage site.		
5.17	Assists client to comfortable position.		
	<b>REPLACEMENT AND RECORDING</b>		
5.18	Properly disposes uncapped needle and syringe.		
5.19	Disposes the waste		
5.20	Performs hand hygiene		
5.21	Records medication administration immediately		
5.22	Evaluates for therapeutic response.		

### **SCORING KEY**

$\leq 50 \%$	Inadequate Practice
51 – 75 %	Moderately Adequate Practice
$\geq 75 \%$	Adequate Practice

## APPENDIX – J<sub>5</sub>

### CAPACITY BUILDING ON MEDICATION MANAGEMENT

CONTENT FOR TEACHING	
TOPIC	- Capacity building program on medication management
Group	- B.Sc (N) III year students
Place	- Apollo College of Nursing
Duration	- 1 hour
Methods of Teaching	- Lecture and Discussion
Teaching Aids	- Power point presentation, Booklet
Educator	- II – year M.Sc.,(N) Student Apollo College of Nursing, Chennai.
<b>General objective</b>	
At the end of the class the students will gain adequate knowledge on medication management and develop desirable practice and attitude on medication management and practice the skills of medication management in the Hospital and Community.	

### **Specific Objectives**

The students will be able to


- List down the importance of medication management
- Define medication management
- Enumerate on JCIA standards
- State the standard MM.10
- Explain the aspects of selection and procurement in medication management
- Give a brief account on storage of medication
- Discuss regarding ordering and transcribing in medication management
- Describe the aspects of Preparing and dispensing in medication management
- Elaborate the medication management standards in administration
- Explain the monitoring medication management standards
- Explicit the medication management standards

## **INTRODUCTION**

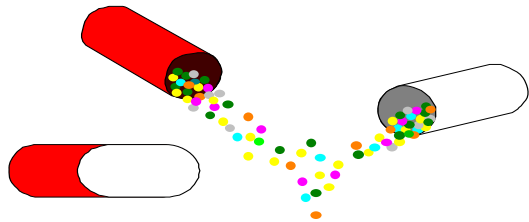
Nurse plays a significant role in medication administration. She is expected to develop competency and accountability for her actions. The recent statistics shows that in the year 2010, The Institute of medicine estimates that preventable medication errors result in more than 7,000 deaths each year in hospitals alone and tens of thousands more in outpatient facilities. These medication errors can be fatal sometimes, so the nurses should be efficient and show excellence in their medication management process to prevent medication errors.


Time	Specific Objective	Content	Teachers and Learners activity	Av aids.	Evaluation
3 min		<p style="text-align: center;"><b>MEDICATION MANAGEMENT</b></p> <p><b>INTRODUCTION:</b></p> <p>Joint commission international (JCI) is an international nonprofit affiliate of the joint commission on accreditation of health care organizations (JCAHO) .The mission of joint commission international is to continuously improve the safety and quality of care in the international community through the provision of education and consultation services and international accreditation</p>	Introducing the topic and participating in the discussion	PPT	
2 min	List down the importance of medication management	<p><b>IMPORTANCE:</b></p> <ul style="list-style-type: none"> <li>➤ To promote medication safety</li> <li>➤ To prevent medication errors</li> <li>➤ To follow the medication policy and standards</li> </ul>	Listing out the importance and listening	PPT	List down the importance of

2 min	Define medication management	<p>➤ To promote a quality care</p> <p><b>DEFINITION:</b></p> <p>Medication management is the term used to describe the medication related therapies that is prescribed for a patient in a hospital.</p> <p>The medication management system includes the Physician, Pharmacist and nurse.</p>	Defining and listening	PPT	medication management Define medication management
2 min	Enumerate on JCIA standards	<p><b>JCAHO STANDARDS:</b></p> <p>The Joint Commission's standards for medication management (MN) are the most rigorous and challenging for an organization to implement.</p> <p>The stages of medication management system are Selection, Procurement, Storage, Ordering, Dispensing, Administration and Monitoring must be appropriately integrated in to a comprehensive medication management system.</p>	Explaining and Listening	PPT	What do you know about JCIA standards?


					
		<p><b>PATIENT SAFETY GOAL 2009</b></p> <p>The Joint Commission (JC) reaffirmed the need to prevent medication errors in their patient safety goals for 2009. The standards mandated</p> <ul style="list-style-type: none"><li>(a) Increasing the accuracy of patient identification,</li><li>(b) Enhancing the effectiveness of communication among care givers, and</li><li>(c) Improving the safety of medication administration (JC, 2009).</li></ul>			
2min	State the standard	<p><b>STANDARD MM.1.10</b></p> <p>Patient specific information is readily accessible to those involved in the medication</p>	Stating and discussing	PPT	



	MM.10	<p>management process.</p> <p>Patient medication safety is compromise whenever there is a lack of information .This standard states that</p> <p>Minimum information</p> <ul style="list-style-type: none"><li>a. should be available</li><li>b. Incorporated in to the policy</li><li>c. Accessible when needed</li></ul>			
2min	Explain the aspects of selection and procurement in medication management	<p><b>SELECTION AND PROCUREMENT</b></p>  <p><b>STANDARD MM.2.10</b> - Medications available for dispensing or administration are selected, listed, and procured based on criteria.</p>	Explaining and listening	PPT	Explain the aspects of selection and procurement of medication

5min	Give a brief account on storage of medication	<p>This standard explores that the Hospital should</p> <ul style="list-style-type: none"><li>➤ Involve staff and develop criteria for drugs added /deleted in the formulary</li><li>➤ The criteria includes indication for use, effectiveness, risks, errors</li><li>➤ The formulary includes strength, form (for example tablet, capsule. Injection, topical ointment and the list is readily available and reviewed once a year and the list is readily accessible when requested.</li><li>➤ The organization should have an established process for handling drug shortages</li></ul> <p><b>STORAGE</b></p>  <p><b>STANDARD MM .2.20-</b> Medications are properly and safely stored throughout the hospital</p> <p>This standard states that</p>	Lecturing and listening	PPT	Make a brief account on storage of medications
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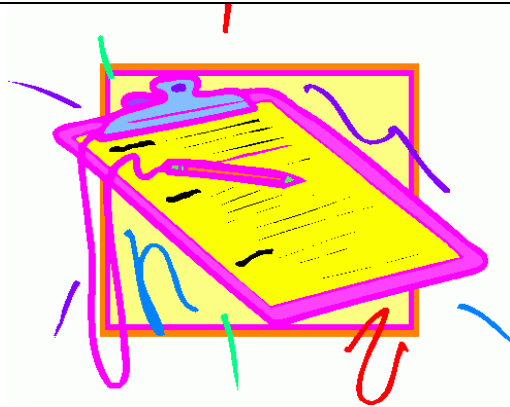
		<ul style="list-style-type: none"> <li>➤ Approved medications stocked and stored</li> <li>➤ Storage at stable environment example, vaccines stored at appropriate temperature.</li> <li>➤ These medications are Secured based on law and regulation</li> <li>➤ The Expired, damaged, and/or contaminated medications to be segregated from other medication until they are removed from the organization.</li> <li>➤ The JCIA standard reported many actual or near miss errors with look alike and sound alike medication, reagents and chemicals.</li> <li>➤ Medications should be accurately labeled including the content, expiration, date and warnings.</li> <li>➤ The National Patient Safety goals for 2003-2004 mandated that to limit and standardization of drug concentrations.</li> <li>➤ The organization should place a special warning label and should not stock concentrated electrolytes in the patient care units and Concentrated electrolytes used with warning</li> <li>➤ This standard insists that the special cabinets, refrigerator etc.</li> </ul>			
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10min	Discuss regarding ordering and transcribing in medication management	<ul style="list-style-type: none"><li>➤ This standard implies that the Emergency medications are consistently available, controlled and secured in the patient care units.</li><li>➤ This standard emphasizes that the organization should not forget to consider product integrity based on hoe it was stored, label information, expiration dates and sanitation.</li></ul> <p><b>ORDERING AND TRANSCRIBING</b></p>  <ul style="list-style-type: none"><li>➤ Health care organizations are taking major efforts to eliminate the verbal and handwritten communication of an order.</li></ul>	Discussing and listening	PPT	How do you order or transcribe medication?
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		<ul style="list-style-type: none"> <li>➤ The emerging and evolving practice of Computer prescriber order entry [CPOE] systems is designed to help prevent transcription errors as well as to serve as a decision support tool for prescribers.</li> <li>➤ A functioning CPOE system alerts the prescribers regarding potential drug allergies, interactions, duplicative therapy, drug outlines and other contraindication .it remains like a future initiative</li> </ul> <p><b>The standard states that</b></p> <ul style="list-style-type: none"> <li>➤ Only medication needed for treating the patients condition are ordered. A key purpose of this standard is to reduce the risk of medication errors because of very few look-alike and sound alike medications have the same indications.</li> <li>➤ The main component of this standard is that the Medication orders written clearly and transcribed accurately. A complete medication order should contain a minimum of drug name, dose, frequency and other parameter .The hospital should take action on incomplete, illegible or unclear order. This standard key purpose is to minimize telephone, verbal orders</li> </ul>			
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		<ul style="list-style-type: none"><li>➤ The organization should review and update preprinted order sheets as needed.</li><li>➤ The hospital also specifies the required elements of any of the following types of orders that it deems acceptable for use.</li><li>➤ PRN- As needed</li><li>➤ Standing orders</li><li>➤ Hold order</li><li>➤ Automatic stop orders</li><li>➤ Resume orders</li><li>➤ Titrating</li><li>➤ Taper</li><li>➤ Automatic stop order</li><li>➤ Range orders.</li></ul> <p>The JCIA Standard also insist on the following to be followed in each organizations They are,</p>			
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		<ul style="list-style-type: none"> <li>➤ The Orders for compounded drugs or drug mixtures not commercially available</li> <li>➤ Orders for medication-related devices [for example, nebulizers and catheters]</li> <li>➤ Orders for investigational medications</li> <li>➤ Orders for herbal products</li> <li>➤ Orders for medications at discharge.</li> </ul> <p>This standard focuses when the weight –based dosing for pediatric populations is required for example, a hospital with intensive care unit may require each component of a total parenteral nutrition formula to be ordered on a ‘Per kg per day’ basis for neonates.</p> <p><b>The standard emphasize that the</b></p> <ul style="list-style-type: none"> <li>➤ Hospitals should minimize the use of verbal and telephone orders and goes hand in hand with and a NATIONAL PATIENT SAFETY GOALS requiring write-down /read-back of physician orders and critical lab results.</li> <li>➤ Organizations to review and update preprinted order sheets as needed</li> <li>➤ Organizations to specify that blanket reinstatement of previous orders for medications is not acceptable practice</li> </ul>			
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The drug order, written by the physician, it has 7 essential parts for administration of drugs safely .They are

- 1- Patients full name.
- 2- Date.
- 3- Drug name.
- 4- Dosage.
- 5- Route of administration.
- 6- Time and frequency



10min	Describe the aspects of Preparing and dispensing in medication management	<p>7- Signature of physician.</p> <p><b>PREPARING AND DISPENSING</b></p> <p><b>STANDARD MM.4.10</b> – All prescriptions or medication orders are reviewed for appropriateness.</p> <ul style="list-style-type: none"> <li>➤ This standard expect an physician/ licensed independent practitioner controlled or urgent situations, a pharmacist should review each medication order prior to dispensing or removal from floor stock or automated dispensing machine</li> <li>➤ It requires a retrospective pharmacist to review the medication order as soon as the hospital pharmacy reopens or the pharmacist is available.</li> </ul> <p>This standard clarifies that,</p> <ul style="list-style-type: none"> <li>➤ Minimum components of the order review to determine the following</li> <li>➤ The appropriateness of the drug, dose, frequency, and route of administration</li> <li>➤ Real or potential allergies or sensitivities</li> </ul>	Lecturing and discussing	PPT	What are the standards in preparing and dispensing medication?
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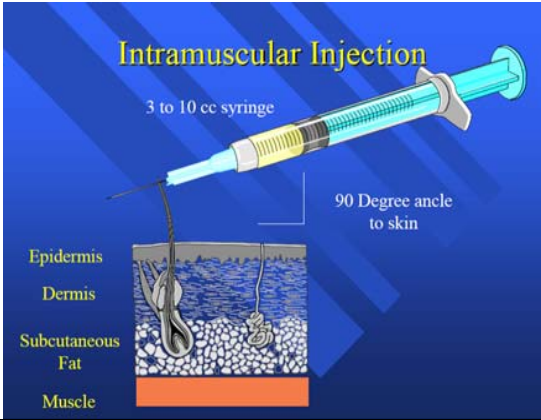
		<ul style="list-style-type: none"><li>➤ Real or potential interactions between the prescription and other medications, food, and laboratory values</li><li>➤ Other contraindications variation from organizational criteria for use</li><li>➤ Other relevant medication-related issues or concerns</li></ul> <p>This standard sets the obvious expectation to communicate to the prescriber any concerns identified in the medication order review prior to dispensing.</p> <p><b>STANDARD .M.M.4.20</b> - Medications are prepared safely.</p> <p>This standard requires the on-site pharmacy, if applicable to prepare all sterile medications, admixtures, or other compounded drugs, expect in emergency situations or short-stability situations.</p> <p>It focuses on the staff's use of appropriate safety materials and equipment wherever hazardous medications are prepared [hospital, patient, home, facility, or clinic] for example a biological safety hood and personal protective supplies to prevent staff or environmental exposure to biohazards during chemotherapy preparation for administration. It mainly focus on the requirements and techniques to accurately prepare medications and avoid</p>			
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		<p>contamination</p> <p><b>STANDARD MM.4.30</b> Medications are appropriately labeled</p> <p>The organizations should establish and use a standardized approach to medication labeling that is consistent with applicable law and regulation and standards of practice</p> <p>This standard outlines the expectation for appropriate labeling of a medication container (for example bag, syringe, bottle, box) when one or more medications are prepared but are not administered immediately.</p> <p>This standard outlines the minimum required components for medication container labels when a medication is not immediately administered</p> <ul style="list-style-type: none"><li>➤ Drug name,</li><li>➤ strength,</li><li>➤ amount,</li><li>➤ if not apparent [expiration date, when used within more than 24 hours after preparation :expiration time,</li></ul>			
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		<p>➤ If shorter than 24 hours ] and the date prepared and diluents for IV admixtures and parenteral nutrition solution.</p> <p>When individualized medications are prepared for multiple patients, or immediately administers them the label must also include the patient name ,location or attached as an accessory label).</p> <p><b>STANDARD MM.4.40</b> Medications are dispensed safely</p> <p>➤ The fundamental practices of safe medication dispensing include the following</p> <p>➤ Dispensing appropriate quantities the patient needs while minimizing diversion potential</p> <p>➤ Meeting all applicable law and regulation as well as professional standards ,including record keeping</p> <p><b>STANDARD MM.4.50</b> Dispensing medications in a timely manner to meet patient need</p> <p>The organization should dispense the medications in the most ready to administer form available from the manufacturer, when feasible, or in unit-doses [prepared by the pharmacy or a licensed repackager].</p>			
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		<p>The organization should use a consistent dispensing system or ensuring that staff provide patient education when packaging systems are different [this is not required in ambulatory care].</p> <p><b>STANDARD MM.4.50</b> The hospital has a system for safely providing medications to meet patient needs when the pharmacy is closed.</p> <p>The organization requires a process for providing the medications when the pharmacy is closed</p> <p>The organization requires a process to enable non pharmacist healthcare professionals [according to all applicable law and regulation] to obtain medications after hours by using the following safeguards</p> <ul style="list-style-type: none"> <li>➤ A limited set of medications is in a night cabinet ,an automated storage and distribution device ,or a limited section of the pharmacy</li> <li>➤ Only trained designated prescribers and nurses have access to the</li> <li>➤ limited set of medications.</li> <li>➤ Quality control procedures are in place to prevent retrieval errors</li> </ul>			
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		<ul style="list-style-type: none"><li>➤ ,including independent double-checks ,bar coding or other verification</li><li>➤ Staff have on-call or other 24/7 access to a qualified pharmacist for medication questions</li></ul> <p><b>STANDARD MM.4.60</b> - If the organization does not operate a pharmacy but routinely administers medications, the organization has a process for obtaining medications from a pharmacy.</p> <p>This process requires organization for obtaining medication from a pharmacy for its use in patient care.</p> <p>Is similar to the requirements for it requires a process to obtain medications from another source in the event of urgent or emergent conditions when the provider pharmacy is closed.</p> <p>hospitals that do not have 24-hour coverage</p> <p><b>STANDARD MM.4.70</b> - Medications dispensed by the hospital are retrieved when recalled or discontinued by the manufacturer or the food and drug administration (FDA) for safety reasons</p> <p>The three EP 's require the following</p>			
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15min	Elaborate the standards in medication administration	<ul style="list-style-type: none"><li>➤ Retrieving and disposing of these medications</li><li>➤ Informing physicians and staff who order , dispense, or administer these medications</li><li>➤ Identifying and informing physicians which patient's received these medications.</li></ul> <p><b>STANDARD MM.4.80</b> - Medications returned to the pharmacy are appropriately managed.</p> <p>This standard states that the organization should have a process to address how medications will be managed by the pharmacy or organization if and when they are unused, expired, or returned. Returning medications prevent diversion and accounts for drugs. and to address how [and if] outside sources are used for destruction of medications</p> <p><b>ADMINISTERING</b></p>  <p>The diagram illustrates an intramuscular injection. A 3 to 10 cc syringe is shown at a 90-degree angle to the skin. The skin layers are labeled: Epidermis, Dermis, Subcutaneous Fat, and Muscle. The needle is shown penetrating the muscle layer.</p>	Lecturing cum discussion	PPT	Enumerate the steps for administration of medication?
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		<p><b>STANDARD MM.5.10</b> - Medications are safely and accurately administered.</p> <p>The elements of practice for this standard outline the process such as,</p> <ul style="list-style-type: none"> <li>➤ Identify the patient using two established individual identifiers</li> <li>➤ Verify that the medication is correct : check the medication order against the label</li> <li>➤ Verify the expiration date and check for [visual] integrity of the medication</li> <li>➤ Verify that there are no contraindications</li> <li>➤ Validate that the drug is given at the proper time, at the prescribed dose, and via the correct route</li> <li>➤ Inform the patient of any potential Adverse drug reactions to watch out for [ as part of ongoing patient education]</li> <li>➤ Address any concerns with the prescriber before administering the medication.</li> </ul> <p><b>STANDARD MM.5.20</b> -Self-administered medications are safely and accurately administered</p> <p>This standard requires procedures that address that the safe self-administration of medications [when allowed] to include patient [or non-staff-member] training</p>			
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5min	Explain the system of monitoring medication management.	<p>➤ This standard states that the organization requires training and information as well as determine of competency to ensure that they understand the correct process as any monitoring parameters, including the side effects.</p> <p><b>MONITORING</b></p> <p><b>STANDARD MM.6.10</b> - Effects of medication(s) on patients are monitored.</p> <p>Expands the source of information for medication monitoring to include the patient's own perceptions [for eg. Perceptions of any side effects they may be experiencing] as well as the patient's record, relevant laboratory results, clinical response, and the medication profile.</p> <p>➤ The hospital responds appropriately to actual or potential adverse drug events and medication errors.</p> <p>➤ Maintain a process to respond to an actual or potential adverse drug reactions or medication error.</p> <p>➤ Identify appropriate action to take when an Adverse drug reactions or a medication error</p> <p>➤ Comply with internal and external reporting requirement for an adverse drug</p>	Appraising and listening	PPT	What are the steps to monitor the effects of medication?
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		<p>reactions or a medication error.</p> <p>HIGH –RISK MEDICATIONS</p> <p><b>STANDARD MM.7.10</b> - The hospital develops processes for managing high-risk or high-alert medications.</p> <p>This standard insists that all organizations to identify and define special processes for procuring, storing, ordering and monitoring their high-risk/high-alert medications</p> <p><b>STANDARD MM.7.20</b> - Psychotropic medication use is monitored</p> <p>For the organization to meet this standard it requires the following.</p> <ul style="list-style-type: none"><li>▪ An interdisciplinary process</li><li>▪ Use only when indicated by assessment and medical necessity, after nonpharmacological interventions/alternatives are considered or used , and at the lowest effective therapeutic dose</li></ul> <p><b>STANDARDMM.7.30</b> -The use of psychopharmacologic drugs is monitored.</p> <p>The written policies and procedures for the use of multiple psycho pharmacological agents,</p>			
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4min	Explicit the evaluation of medication management	<p>the use of high-dose pharmacotherapy, and the prevention, identification, and management of tardive dyskinesia should be initiated in each organization for the quality improvement</p> <p><b>STANDARD MM.7.40</b> - Investigational medications are safely controlled and administered. This standard stands with a written process for reviewing, approving, supervising, and monitoring the investigational drug use.</p> <p><b>EVALUATION</b></p> <p><b>STANDARD MM.8.10</b> - The hospital evaluates its medication management system. All organizations will be expected to do following</p> <ul style="list-style-type: none"> <li>➤ Evaluate for risk points and identify areas to improve safety</li> <li>➤ Routinely evaluate the literature for best practices and new technology</li> <li>➤ Evaluate internally generated reports to identify trends or issues</li> <li>➤ The pharmacy and long term care facility must collaborate to determine whether the medication management system is effective</li> <li>➤ To implement a medication management system to control all medications</li> </ul>	Lecturing and discussing	PPT	What is the standard to evaluate medication management ?
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		<p>➤ Requires that the primary provider of pharmaceutical services or consultant pharmacist participate in educating the long term care facility about the collection and use of performance measures for medication management and techniques to reduce medication errors and minimize medication waste.</p> <p><b>CONCLUSION</b></p> <p>The Medication Management standards clearly illustrate that safe and effective medication management requires multidisciplinary and multifaceted effort. The Hospital should continuous evaluate for medication errors and adverse drug reactions in order to improve the quality and safety in patient care.</p> <p>‘Anyone can make the simple complicated. Creativity is making the complicated simple.’</p> <p>- Charles Mingus.</p>			
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POWERPOINT SLIDES

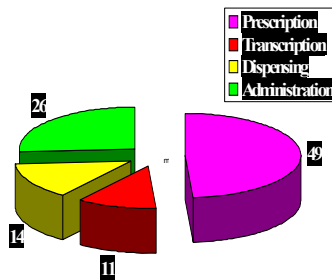
# Medication Management

PRESENTED BY :  
E.PAULINE.  
II YEAR MSc NURSING

## DEFINITION

Medication Management is the term used to describe the medication related therapies that is prescribed for a patient in an Hospital.

## Safe Medication Management Program report -2009



## IMPORTANCE

- TO PROMOTE MEDICATION SAFETY
- TO PREVENT MEDICATION ERRORS
- TO FOLLOW THE MEDICATION POLICY AND STANDARDS
- TO PROMOTE A QUALITY CARE

## TEN RIGHTS

- RIGHT PATIENT
- RIGHT MEDICATION
- RIGHT DOSE
- RIGHT ROUTE
- RIGHT TIME
- RIGHT DOCUMENTATION
- CLIENT EDUCATION
- RIGHT TO REFUSE
- RIGHT ASSESSMENT
- RIGHT EVALUATION



## JCAHO STANDARDS

The Joint Commission (JC) reaffirmed the need to prevent medication errors in their patient safety goals for 2009. The standards mandated are

- (a) increasing the accuracy of patient identification,
- (b) enhancing the effectiveness of communication among care givers, and
- (c) of medication administration (JC, 2009).

### **STANDARD MM.1.10**

It states that Minimum information

- Patient specific information is readily accessible to those involved in the medication management process.
- should be available
- Incorporated in to the policy
- Accessible when needed

### **SELECTION AND PROCUREMENT STANDARD MM.2.10**

- Medications available for dispensing or administration are selected ,listed, and procured based on criteria .
- Involve staff to develop criteria for drugs added /deleted in the formulary
- The criteria includes indication for use, effectiveness, risks, errors .
- The formulary includes strength, form ,readily available and it is reviewed once a year
- A process for handling drug shortages

### **STORAGE**

STANDARD MM .2.20-

The standard states that

- ✓ Medications are properly and safely stored throughout the hospital
- ✓ Approved medications are stocked and stored
- ✓ at stable environment
- ✓ Secured based on law and regulation
- ✓ Expired, damaged, or contaminated medications to be segregated.

### **STORAGE COTN...**

- Separation of inventory of actual or near miss errors
- Medications are accurately labeled including the content, expiration, date and warnings.
- NPG-Standardization of drug concentrations.
- Concentrated electrolytes used with warning
- Emergency medication are consistently available ready to administer, age specific and unit dosed.

### **ORDERING AND TRANSCRIBING MM.3.10**

- The emerging and evolving practice of Computer prescriber order entry [CPOE] systems is designed to help prevent transcription errors
- Medication' needed for patient's are ordered.
- Medication errors commonly occurs among look alike and sound alike medication
- Medication orders written clearly and transcribed accurately.

### **MM.3.20**

- The hospital specifies the required elements of any of the following types of orders that is deems acceptable for use.
- For TPN in neonates the order is given as per kg per day
- PRN- As needed
- Standing orders
- Hold orders
- Automatic stop orders
- Resume orders

### TYPES OF ORDERS COTN...

- TITRATING ORDER- Orders in which the dose is either progressively increased or decreased in response to the patient status
- TAPER ORDER-Orders in which the dose is decreased by a particular amount with each dosing interval
- RANGE ORDER-Orders in which the dose or dosing interval varies over a prescribed range, depending on the situation or patient's status

### PREPARING AND DISPENSING MM.4.10

This standard states that

- Medication orders should be reviewed for appropriateness .
  - Physician / Pharmacist should review order in emergency situations
  - Medications should be prepared safely
- IV Admixtures prepared in sterile conditions

### Continued...

- Medications should be labeled
- The medication container should have drug name, strength, amount, if not apparent expiration date, and the date for IV admixtures and Parenteral nutritional solution.
- Medications should be dispensed safely
- When pharmacy is closed the Hospital should provide medications ,quality control procedures to prevent retrieval errors

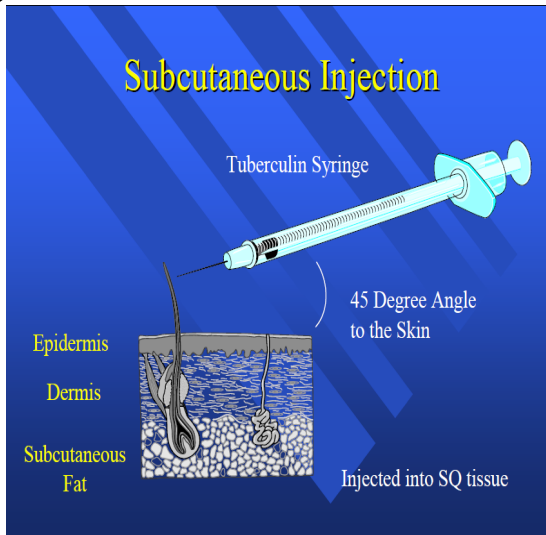
### ADMINISTRATION MM.5.10

- ❖ Medications should be safely and accurately administered
- ❖ The nurse should identify the following
- ❖ Identify the patient using two established individual identifiers
- ❖ Check medication order against the label
- ❖ Verify the contraindications
- ❖ Validate time, dose , route
- ❖ Education –ADE

### ORAL MEDICATION







## INTRAVENOUS ADMINISTRATION

- Perform hand hygiene and apply gloves
- Clean injection port with antiseptic swab
- Insert small-gauge needle of syringe correctly through port
- Inject the medication slowly
- Release tubing, withdraw syringe, and check infusion rate

## MONITORING MM6.10

- The effects on patient should be monitored
- The hospital should respond to potential adverse drug reactions and errors
- The Hospital should take appropriate action when ADR or a medication error occurs.
- Internal and external reporting for the ADE and medication error

## HIGH-RISK MEDICATIONS MM.7.10

- The hospital should develop process for high risk or high alert medications.
- The nurse identifies mental status, perception, or behavior for Psychotropic and psychopharmacological medications

## HIGH-RISK MEDICATIONSMM.7.10

- Investigational medication should be safely administered
- It should be reviewed, supervised, monitored and approved
- Provisions should be provided to accommodate patient's continued participation
- Pharmacy control for storing, dispensing, labeling and distribution must be there.

## EVALUATION MM.8.10

- The hospital evaluates its medication management system.
- Evaluate for risk points and identify areas to improve safety
- Routinely evaluate the literature for best practices and new technology
- Evaluate internally generated reports to identify trends and issues.

### CONCLUSION

- The MM standards clearly illustrate that safe and effective medication management requires multidisciplinary and multifaceted effort.
- The Hospital should continuous evaluate for medication errors and adverse drug reactions in order to improve the quality and safety in patient care.



**APPENDIX - K**  
**DATA CODE SHEET**

**AGE-AGE IN YEARS**

1.118-19 years

1.219-20 years

1.3.21 years

**REG-Religion**

2.1 Hindu

2.2 Muslim

2.3 Christian

2.4 Others

**3. ARE -Area of Posting**

3.1 Medical ward

3.2 Surgical ward

3.3 Others

**4. WOR -Work shift**

4.1Day shift

4.2 Night shift

**5. PRK -Previous Knowledge**

5.1 Yes

5.2 No

**PRT – Pre test score**

POS – Post test score

INF - Inference

**AK – Adequate knowledge**

**MAK–Moderately adequate knowledge**

**IK – Inadequate knowledge**

**HA –High attitude**

**MA – Moderate attitude**

**LA – Low attitude**

AP – Adequate practice

MAP - Moderately adequate knowledge

IP – Inadequate practice

# APPENDIX – L

## MASTER CODE SHEET

S. No	AGE	REL	ARE	WOR	PRK	KNOWLEDGE						ATTITUDE						PRACTICE					
						PRT	%	INF	POT	%	INF	PRT	%	INF	POT	%	INF	PRT	%	INF	POT	%	INF
1	1.2	2.3	3.2	4.1	5.2	11	44	IK	20	80	AK	43	86	HA	45	90	HA	13	59	MAP	15	68.1	MAP
2	1.2	2.3	3.2	4.1	5.2	8	32	IK	20	80	AK	43	86	HA	43	86	HA	10	45	IP	10	45	IP
3	1.2	2.3	3.2	4.1	5.2	12	48	IK	22	88	AK	32	64	MA	46	92	HA	13	59	MAP	15	62.5	MAP
4	1.2	2.3	3.2	4.1	5.2	13	52	MAK	21	84	AK	34	68	MA	39	78	HA	13	59	MAP	20	83.3	AP
5	1.2	2.1	3.2	4.1	5.2	14	56	MAK	10	40	IK	36	72	MA	39	78	HA	15	68.1	MAP	16	66.6	MAP
6	1.2	2.1	3.1	4.1	5.2	11	44	IK	20	80	AK	23	46	LA	29	58	MA	12	50	IP	20	83.3	AP
7	1.1	2.3	3.1	4.1	5.2	10	40	IK	17	68	MAK	32	64	MA	36	72	HA	11	45.8	IP	11	50	IP
8	1.2	2.3	3.1	4.1	5.2	10	40	IK	20	80	AK	24	48	LA	38	76	HA	16	72.7	MAP	23	95.8	AP
9	1.2	2.3	3.1	4.1	5.2	9	36	IK	11	44	IK	33	66	MA	36	72	MA	5	20.8	IP	15	77.2	MAP
10	1.2	2.3	3.1	4.1	5.2	9	36	IK	22	88	AK	38	76	HA	40	80	HA	15	68.1	MAP	19	79.1	AP
11	1.2	2.3	3.3	4.1	5.2	18	72	MAK	19	76	AK	43	86	HA	43	86	HA	15	68.1	MAP	18	81.8	AP
12	1.2	2.3	3.3	4.1	5.2	12	48	IK	22	88	AK	31	62	MA	33	66	MA	14	63.6	MAP	21	87.5	AP
13	1.1	2.1	3.3	4.1	5.2	13	52	MAK	15	60	MAK	32	64	MA	34	68	MA	14	63.6	MAP	21	87.5	AP
14	1.1	2.1	3.1	4.1	5.2	10	40	IK	18	72	MAK	23	46	LA	36	72	MA	15	68.1	MAP	19	79.1	AP
15	1.3	2.3	3.3	4.1	5.2	12	48	IK	20	80	AK	23	46	LA	38	76	HA	13	59	MAP	19	79.1	AP
16	1.1	2.1	3.3	4.1	5.2	4	16	IK	12	48	IK	22	44	LA	38	76	HA	15	68.1	MAP	16	72	MAP
17	1.2	2.1	3.1	4.1	5.2	17	68	MAK	20	80	AK	24	48	LA	30	60	MA	11	50	IP	19	79.1	AP
18	1.2	2.3	3.1	4.1	5.2	15	60	MAK	21	84	AK	40	80	HA	40	80	HA	14	58.3	MAP	19	79.1	AP
19	1.2	2.3	3.3	4.1	5.2	8	32	IK	18	72	MAK	31	62	MA	35	70	MA	15	68.1	MAP	21	87.5	AP
20	1.2	2.2	3.1	4.1	5.2	7	28	IK	19	76	AK	38	76	HA	42	84	HA	15	68.1	MAP	16	72	MAP
21	1.1	2.1	3.1	4.1	5.2	12	48	IK	19	76	AK	34	68	MA	37	74	MA	12	54.5	MAP	20	83.3	AP
22	1.2	2.1	3.1	4.1	5.2	9	36	IK	19	76	AK	32	64	MA	37	74	MA	11	50	IP	20	83.3	AP
23	1.2	2.3	3.3	4.1	5.2	13	52	MAK	21	84	AK	34	68	MA	38	76	HA	16	6.6	MAP	17	77.2	AP
24	1.2	2.3	3.3	4.1	5.2	8	32	IK	18	72	MAK	42	84	HA	43	86	HA	8	36.3	IP	19	79.1	AP
25	1.2	2.1	3.1	4.1	5.2	9	36	IK	16	64	MAK	47	74	MA	46	92	HA	9	40.9	IP	10	45	IP
26	1.2	2.3	3.1	4.1	5.2	12	48	IK	20	80	AK	27	54	MA	30	60	MA	13	59	MAP	18	81.8	AP
27	1.2	2.3	3.1	4.1	5.2	8	32	IK	9	36	IK	36	72	MA	39	78	HA	9	40.9	IP	14	63.6	MAP
28	1.2	2.3	3.1	4.1	5.2	12	48	IK	13	52	MAK	30	60	MA	37	74	MA	14	63.6	MAP	16	72.7	MAP
29	1.2	2.3	3.2	4.1	5.2	9	36	IK	19	76	AK	38	76	HA	46	92	HA	7	31.8	IP	16	72.7	MAP
30	1.2	2.1	3.1	4.1	5.2	11	44	IK	13	52	MAK	34	69	MA	37	74	MA	9	40.9	IP	16	66.6	MAP

